

Hunters Point Naval Shipyard, Parcel G, RSY Data Report

| Contract No. N62473-17-D-006 CTO N6247318F5065 RSY Pad Data Report | | | | | | | |
|--------------------------------------------------------------------|--|--|--|-------------------------------------------|--|--|--|
| RSY Pad: RSY 11 Use 3 | | | | Soil Origin: TU-099C ESU | | | |
| Data attached and submitted by: Amy Mangel | | | | Data Report Submittal Date: 02/02/2021 | | | |

| Systematic Soil Sample Data: RSY 11 Use 3 | | | | | | | |
|-------------------------------------------|-----------------|----------------|------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------|
| Sample Identification | Sample Location | Type of Sample | Gamma Static 3x3 NaI Reading (CPM) | Gamma 3x3 Static Investigation Level (CPM) | ²²⁶ Ra Final Analytical Results (pCi/g) | ¹³⁷ Cs Final Analytical Results (pCi/g) | ⁹⁰ Sr Final Analytical Results (pCi/g) |
| Project Remediation Goals* | | | | | 1.861 | 0.141 | 0.331 |
| HPPG-ESU-TU099C-001 | 1 | Systematic | 9,056 | 15,658 | 0.309 | -0.0152 | 0.0926 |
| HPPG-ESU-TU099C-002 | 2 | Systematic | 8,882 | 15,658 | 0.303 | -0.0239 | N/A |
| HPPG-ESU-TU099C-003 | 3 | Systematic | 8,792 | 15,658 | 0.338 | 0.0114 | N/A |
| HPPG-ESU-TU099C-004 | 4 | Systematic | 9,193 | 15,658 | 0.244 | -0.0117 | N/A |
| HPPG-ESU-TU099C-005 | 5 | Systematic | 9,066 | 15,658 | 0.0537 | -0.0362 | N/A |
| HPPG-ESU-TU099C-006 | 6 | Systematic | 8,739 | 15,658 | 0.351 | -0.00380 | N/A |
| HPPG-ESU-TU099C-007 | 7 | Systematic | 8,993 | 15,658 | 0.404 | 0.00244 | N/A |
| HPPG-ESU-TU099C-008 | 8 | Systematic | 9,130 | 15,658 | 0.352 | 0.0368 | N/A |
| HPPG-ESU-TU099C-009 | 9 | Systematic | 8,790 | 15,658 | 0.349 | 0.000933 | N/A |
| HPPG-ESU-TU099C-010 | 10 | Systematic | 9,055 | 15,658 | 0.464 | 0.00544 | N/A |
| HPPG-ESU-TU099C-011 | 11 | Systematic | 9,330 | 15,658 | 0.305 | 0.00354 | -0.0336 |
| HPPG-ESU-TU099C-012 | 12 | Systematic | 9,386 | 15,658 | 0.342 | 0.0253 | N/A |
| HPPG-ESU-TU099C-013 | 13 | Systematic | 8,791 | 15,658 | 0.329 | -0.0270 | N/A |
| HPPG-ESU-TU099C-014 | 14 | Systematic | 8,925 | 15,658 | 0.349 | -0.0268 | N/A |
| HPPG-ESU-TU099C-015 | 15 | Systematic | 8,384 | 15,658 | 0.370 | 0.00100 | N/A |
| HPPG-ESU-TU099C-016 | 16 | Systematic | 9,057 | 15,658 | 0.222 | 0.00449 | N/A |
| HPPG-ESU-TU099C-017 | 17 | Systematic | 8,851 | 15,658 | 0.338 | 0.000 | N/A |
| HPPG-ESU-TU099C-018 | 18 | Systematic | 9,100 | 15,658 | 0.478 | 0.0241 | N/A |
| HPPG-ESU-TU099C-019 | 19 | Systematic | 8,646 | 15,658 | 0.336 | -0.00349 | N/A |
| HPPG-ESU-TU099C-020 | 20 | Systematic | 8,632 | 15,658 | 0.373 | 0.00994 | N/A |
| HPPG-ESU-TU099C-021 | 21 | Systematic | 8,676 | 15,658 | 0.118 | 0.00130 | 0.153 |
| HPPG-ESU-TU099C-022 | 22 | Systematic | 8,780 | 15,658 | 0.292 | 0.0219 | N/A |
| HPPG-ESU-TU099C-023 | 23 | Systematic | 8,557 | 15,658 | 0.328 | -0.0307 | N/A |
| HPPG-ESU-TU099C-024 | 24 | Systematic | 8,781 | 15,658 | 0.0689 | -0.00771 | N/A |
| HPPG-ESU-TU099C-025 | 25 | Systematic | 8,863 | 15,658 | 0.0424 | -0.0143 | N/A |
| Soil Systematic Sample Statistics | | | | | ²²⁶ Ra Final Analytical Results (pCi/g) | ¹³⁷ Cs Final Analytical Results (pCi/g) | ⁹⁰ Sr Final Analytical Results (pCi/g) |
| | | | | | Maximum | 0.478 | 0.0368 |
| | | | | | Mean | 0.2984 | -0.0021 |
| | | | | | Median | 0.336 | 0.0009 |
| | | | | | Minimum | 0.0424 | -0.0362 |
| | | | | | Standard Deviation | 0.1155 | 0.0185 |
| | | | | | | | N/A |

| Biased Soil Sample Data: RSY 11 Use 3 | | | | | | | |
|---------------------------------------|-----------------|----------------|------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------|
| Sample Identification | Sample Location | Type of Sample | Gamma Static 3x3 NaI Reading (CPM) | Gamma 3x3 Static Investigation Level (CPM) | ²²⁶ Ra Final Analytical Results (pCi/g) | ¹³⁷ Cs Final Analytical Results (pCi/g) | ⁹⁰ Sr Final Analytical Results (pCi/g) |
| Project Remediation Goals* | | | | | 1.861 | 0.141 | 0.331 |
| HPPG-ESU-TU099C-B-001 | 1 | Biased | 9,020 | 15,658 | 0.390 | 0.00936 | -0.0713 |

CPM Counts per minute

pCi/g Picocuries per gram

* Note: Project Remediation goal (RG) is the Record of Decision RG or Offsite RBA value, whichever is higher

| Instrument and Survey Summary | | | | | |
|-------------------------------|--------------------------|------------|--------|----------------------|-----------|
| Activity | Survey # | Date | Meter | Calibration Due Date | Serial # |
| Gamma Walkover Survey | HPRS-12112020-PG-ROV-399 | 12/11/2020 | RS-700 | 03/31/2022 | 5447/5448 |
| Follow-Up Static Survey | HPRS-12112020-PG-JSS-401 | 12/11/2020 | RS-700 | 03/31/2022 | 5447/5448 |
| Systematic Sample Survey | HPRS-12112020-PG-JSS-400 | 12/11/2020 | 3x3 | 08/06/2021 | 108853 |
| Biased Sample Survey | HPRS-12122020-PG-JSS-405 | 12/12/2020 | 3x3 | 08/06/2021 | 108853 |

| Region of Interest (ROI) Summary | |
|----------------------------------|--------------------|
| ROI | Nuclide and Energy |
| ROI 3 | Ra-226 (1764 keV) |
| ROI 6 | Ra-226 (609 keV) |
| ROI 7 | Cs-137 (662 keV) |
| ROI 8 | Ra-226 (351 keV) |
| ROI 10 | Gross Gamma |

| Summary: RSY 11 Use 3 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) Gamma walkover survey and data review—upon review of initial RS-700 scan data in accordance with Final Parcel G Work Plan Section 3.5.1.1, 9 follow-up static investigations were required. Gamma scan data summary statistics, normal Q-Q plots, histograms, and box plots are provided on pages 3-6. Contour maps of the scan data for the ROIs of interest are presented on page 7. The RSY scan data was lower than the background scan data. The exact same RS-700 and detectors were used for the background data collection and the RSY pad data collection. Note: This pad was partially full, which is why there is a smaller number of scan data points. |
| 2) One-minute static follow-up measurements with the RS-700 were collected at 9 gamma walkover investigation locations in accordance with Final Parcel G Work Plan Section 3.3.1. A map of the follow-up locations is presented on page 9. The net follow-up static spectra are presented on pages 14-22. The exact same RS-700 and detectors were used for the background data collection and the RSY pad data collection. |
| 3) In accordance with Final Parcel G Work Plan Section 3.4.1, twenty-five systematic soil samples (001-025) were obtained and submitted for gamma spectroscopy analysis. Sample locations are shown on the Systematic Sample Survey map (page 10). TestAmerica sample results are attached (pages 23-56). Ten percent of the systematic soil samples (three samples in total -001, -011, & -021) were also analyzed for ⁸⁷ Sr. Strontium-90 results are also included in the TestAmerica sample results report (pages 23-56). Samples HPPG-F-059 and HPPG-F-060 are field duplicates, correlating to systematic samples -025 and -009. The Data Quality Assessment which will be included in the RACR will provide an analysis and discussion of field duplicates for the project. The Instrument and Survey Summary table above lists the 3x3 NaI detector used for the gamma static measurements collected during sampling activities, and the instrument-specific gamma static IL listed in the sample tables on page one is developed from that instrument's RBA data. |
| Systematic sample histograms, box plots, Q-Q plots, and power curves are provided on pages 12-13. All sample results were below the applicable RGs. The number of samples collected was sufficient to meet project DQOs. |
| 4) In accordance with Final Parcel G Work Plan Section 3.3.1 and 3.4.1, one biased sample was collected since all follow-up static measurements were below the ROC-specific critical levels. The biased sample was collected from the location of the highest gross gamma scan measurement. TestAmerica sample results are attached (pages 57-71). A map of the biased sample location is presented on page 11. Biased sample results were all below the applicable RGs. |
| Conclusions: In accordance with the DQOs in Section 3.1 of the Final Parcel G Work Plan, final analytical results for all samples from the RSY pad were shown by a point by point comparison to meet the RGs. Graphical comparisons demonstrated that ROC concentrations were consistent with background. RSY 11 Use 3 contains soil from Hunters Point Naval Shipyard Parcel G Phase 1 excavation TU-099C ESU. APTIM requests RASO concurrence to release this soil as Non-LLRW. Disposition: This soil shall be used as backfill for TU-099. |

Soil Scan Statistics

Statistical Summary

| Dataset | | PG-RSY-11-U3 | | | | |
|---------|--|---------------|---------------|------------|--------------|--------------------------|
| ROI | | Minimum (cps) | Maximum (cps) | Mean (cps) | Median (cps) | Standard Deviation (cps) |
| ROI-03 | | 3.01 | 23.05 | 10.83 | 11.02 | 3.45 |
| ROI-06 | | 53.10 | 121.24 | 78.95 | 79.16 | 8.97 |
| ROI-07 | | 40.09 | 101.20 | 62.11 | 61.14 | 8.02 |
| ROI-08 | | 67.14 | 133.32 | 101.01 | 101.21 | 10.55 |
| ROI-10 | | 1,888.90 | 2,339.18 | 2,082.43 | 2,084.56 | 72.49 |

Statistical Summary Reference Background

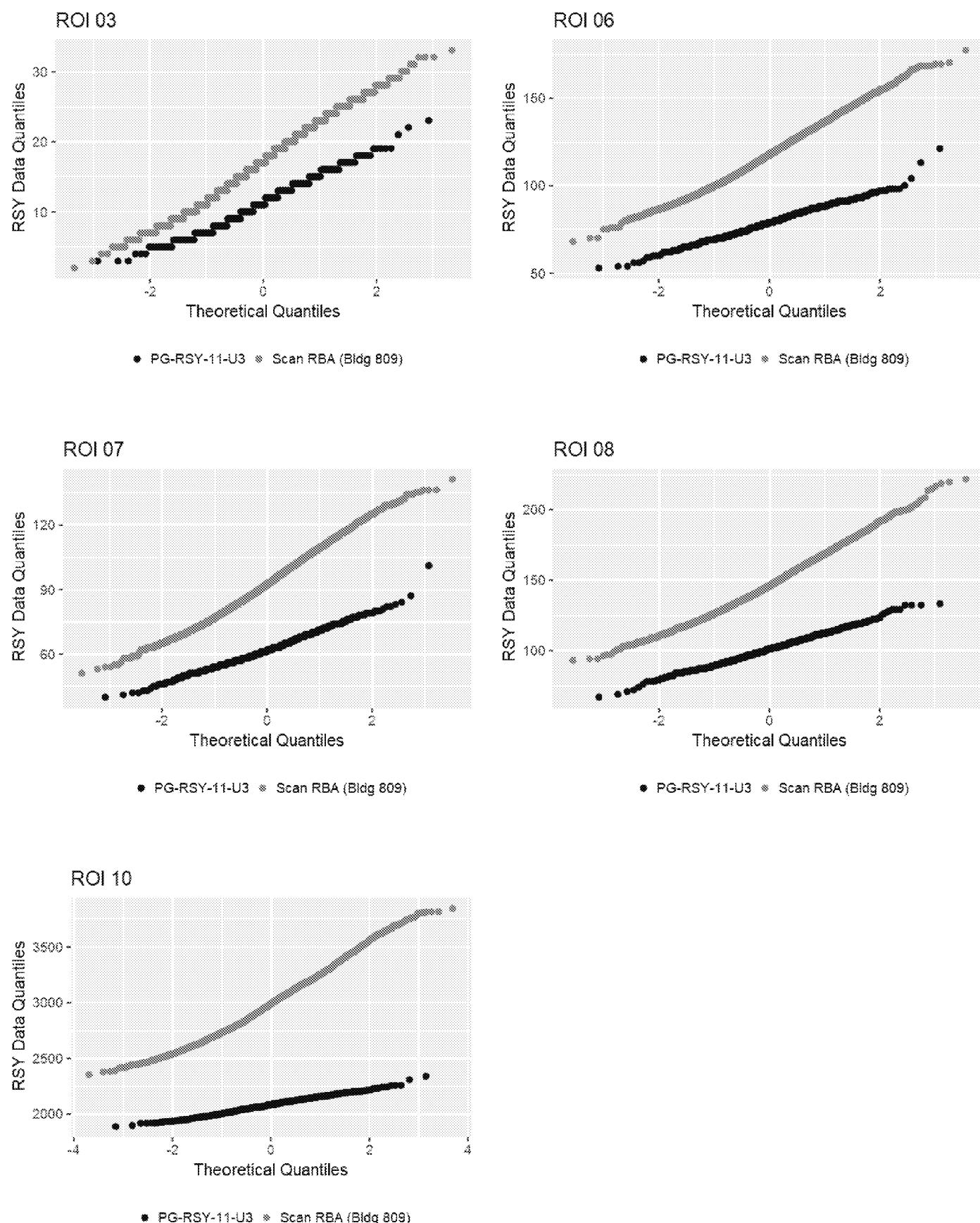
| TYPE | | Scan RBA (Bldg 809) | | | | |
|--------|--|---------------------|---------------|------------|--------------|--------------------------|
| ROI | | Minimum (cps) | Maximum (cps) | Mean (cps) | Median (cps) | Standard Deviation (cps) |
| ROI-03 | | 2.00 | 33.08 | 16.21 | 16.04 | 4.13 |
| ROI-06 | | 68.15 | 177.45 | 117.58 | 117.26 | 15.50 |
| ROI-07 | | 51.11 | 141.33 | 92.34 | 91.24 | 13.43 |
| ROI-08 | | 93.19 | 221.48 | 146.24 | 145.30 | 18.21 |
| ROI-10 | | 2,354.11 | 3,845.31 | 2,995.57 | 2,989.64 | 255.66 |

cps = counts per second

| Dataset | Number of Data Points |
|---------------------|-----------------------|
| PG-RSY-11-U3 | 627 |
| Scan RBA (Bldg 809) | 4632 |

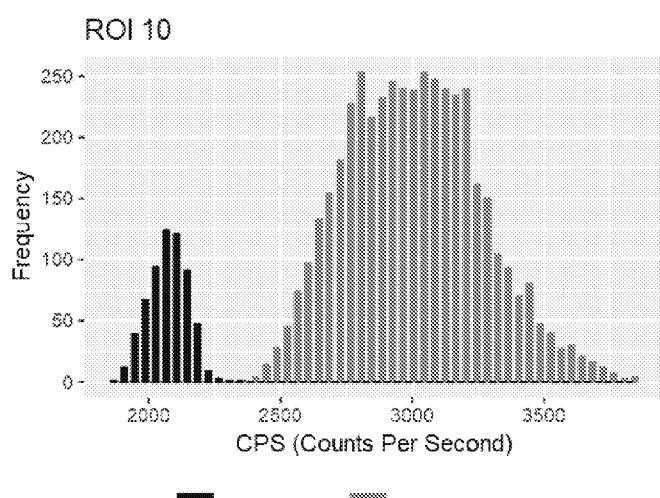
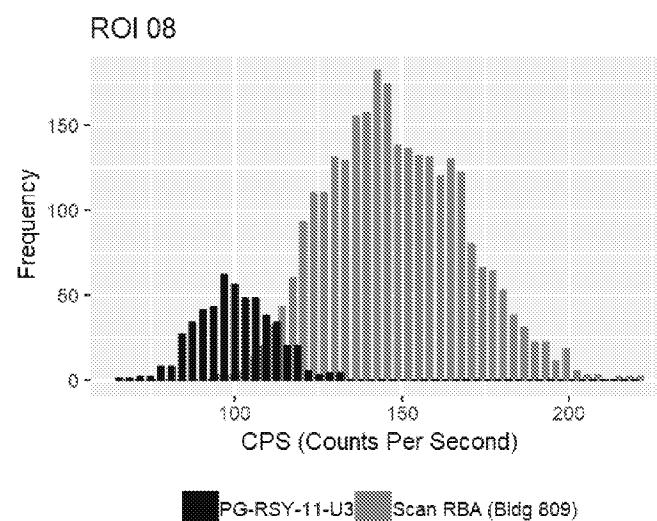
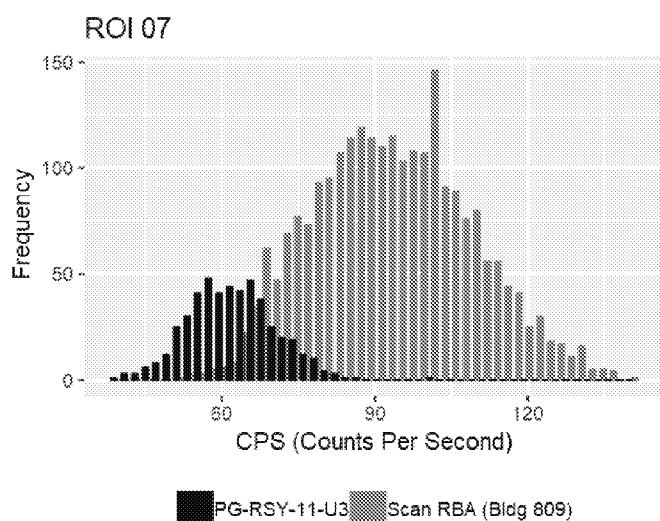
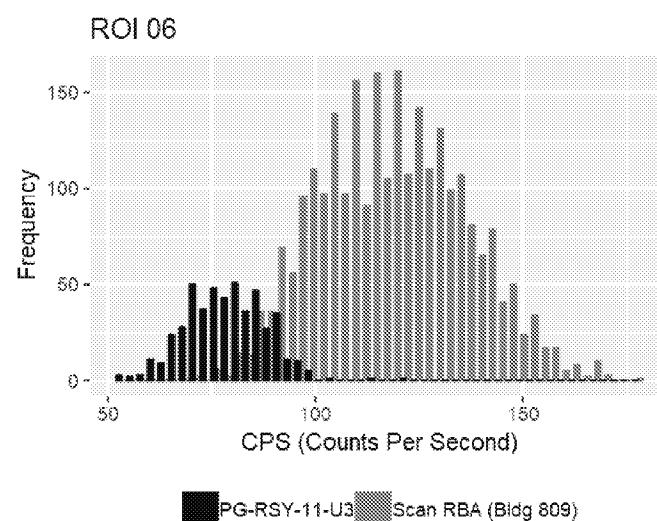
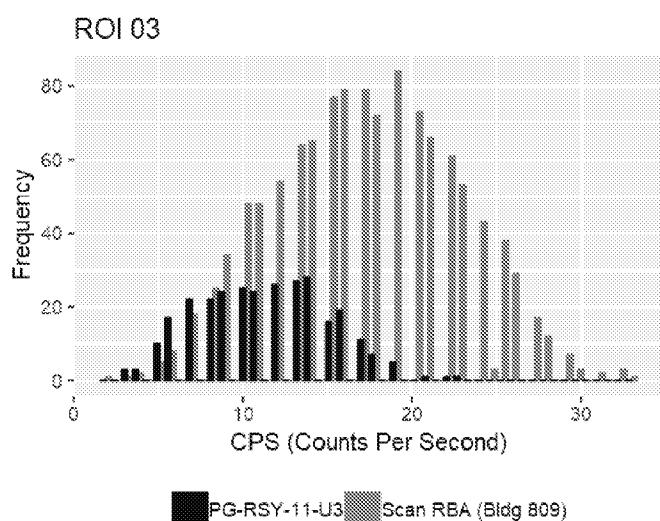
Soil Scan Statistics

Normal Q-Q Plots



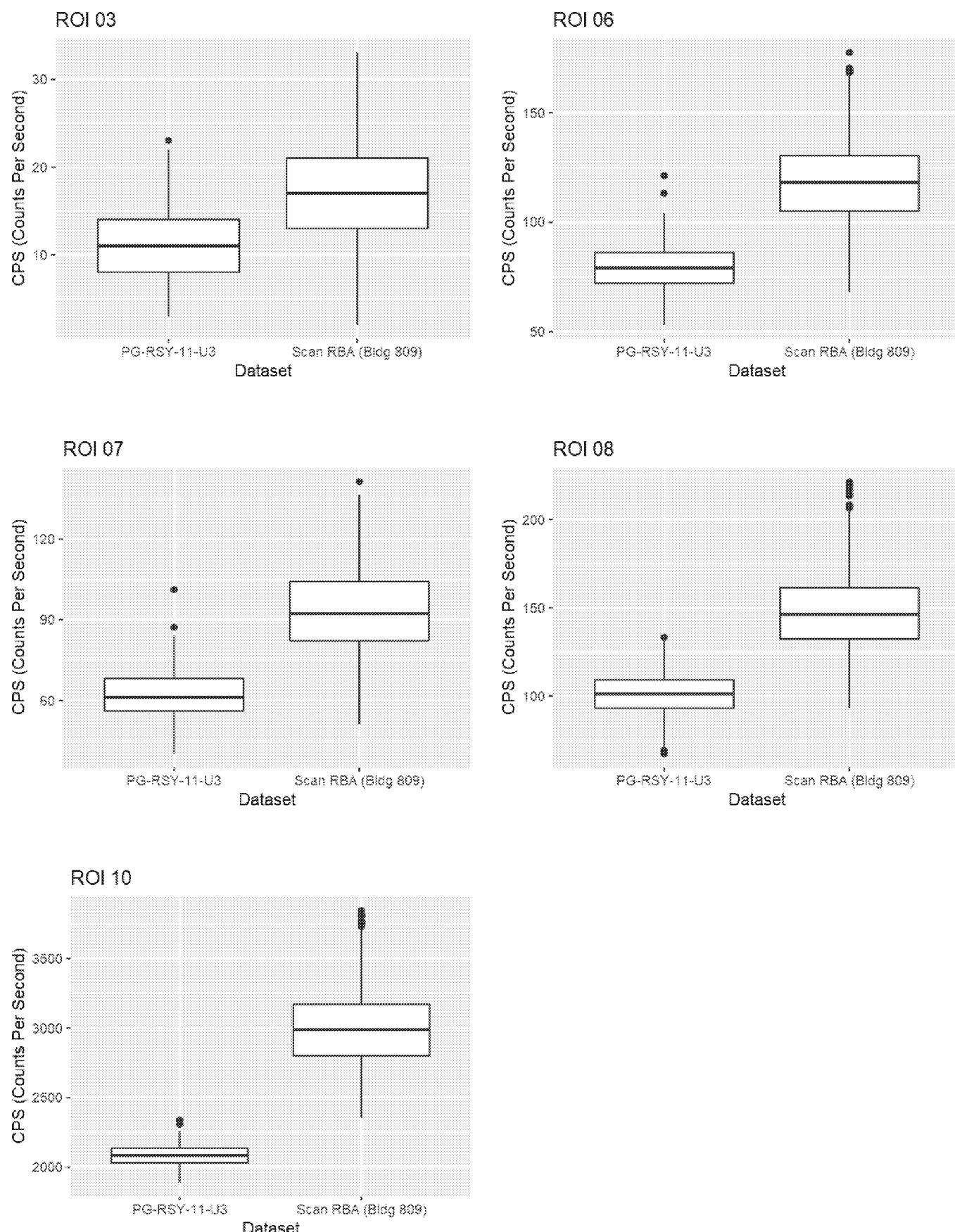
Soil Scan Statistics

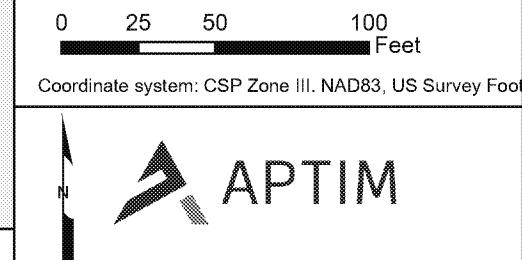
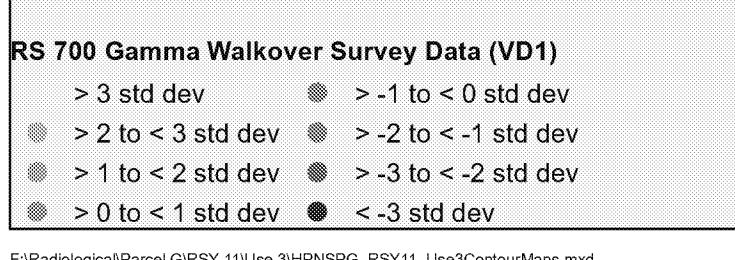
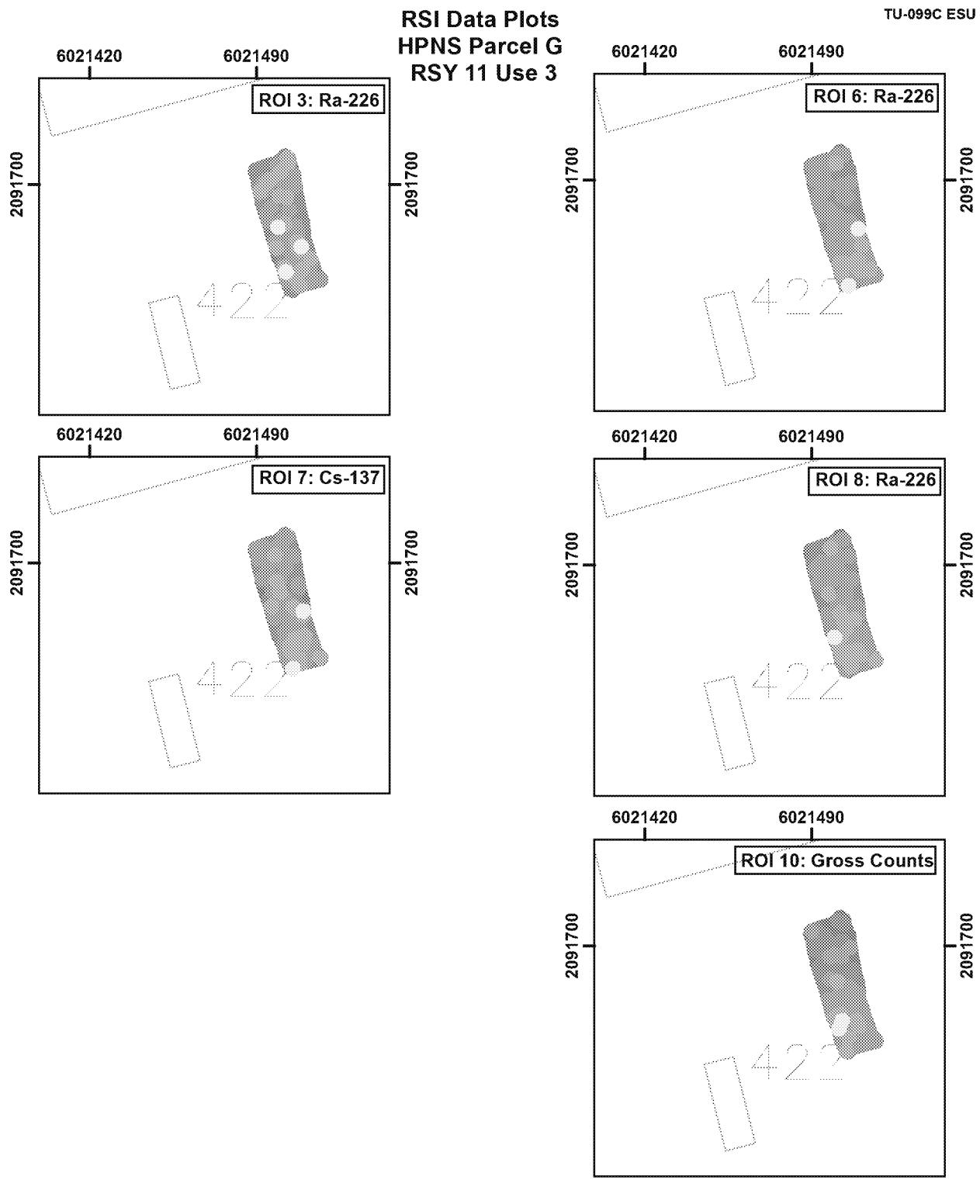
Histograms

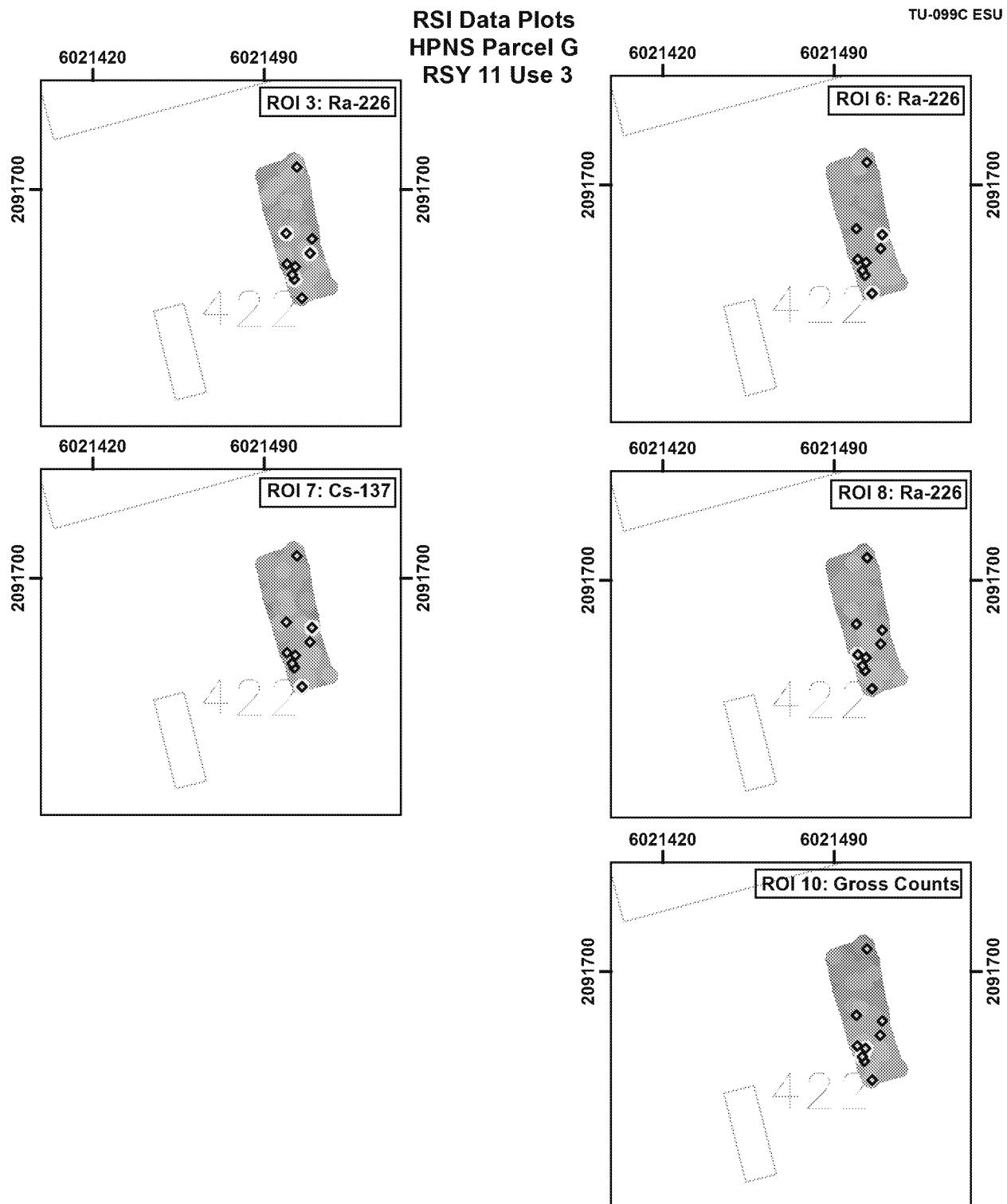


Soil Scan Statistics

Box Plots







RS 700 Gamma Walkover Survey Data (VD1)

- | | |
|----------------------|------------------------|
| ◆ Follow-Up Location | ● > -1 to < 0 std dev |
| > 3 std dev | ● > -2 to < -1 std dev |
| ● > 2 to < 3 std dev | ● > -3 to < -2 std dev |
| ● > 1 to < 2 std dev | ● < -3 std dev |
| ● > 0 to < 1 std dev | |

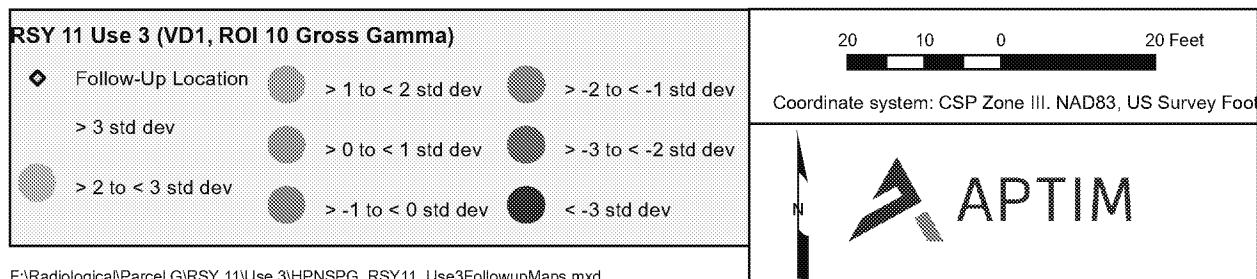
0 25 50 100
Feet

Coordinate system: CSP Zone III, NAD83, US Survey Foot



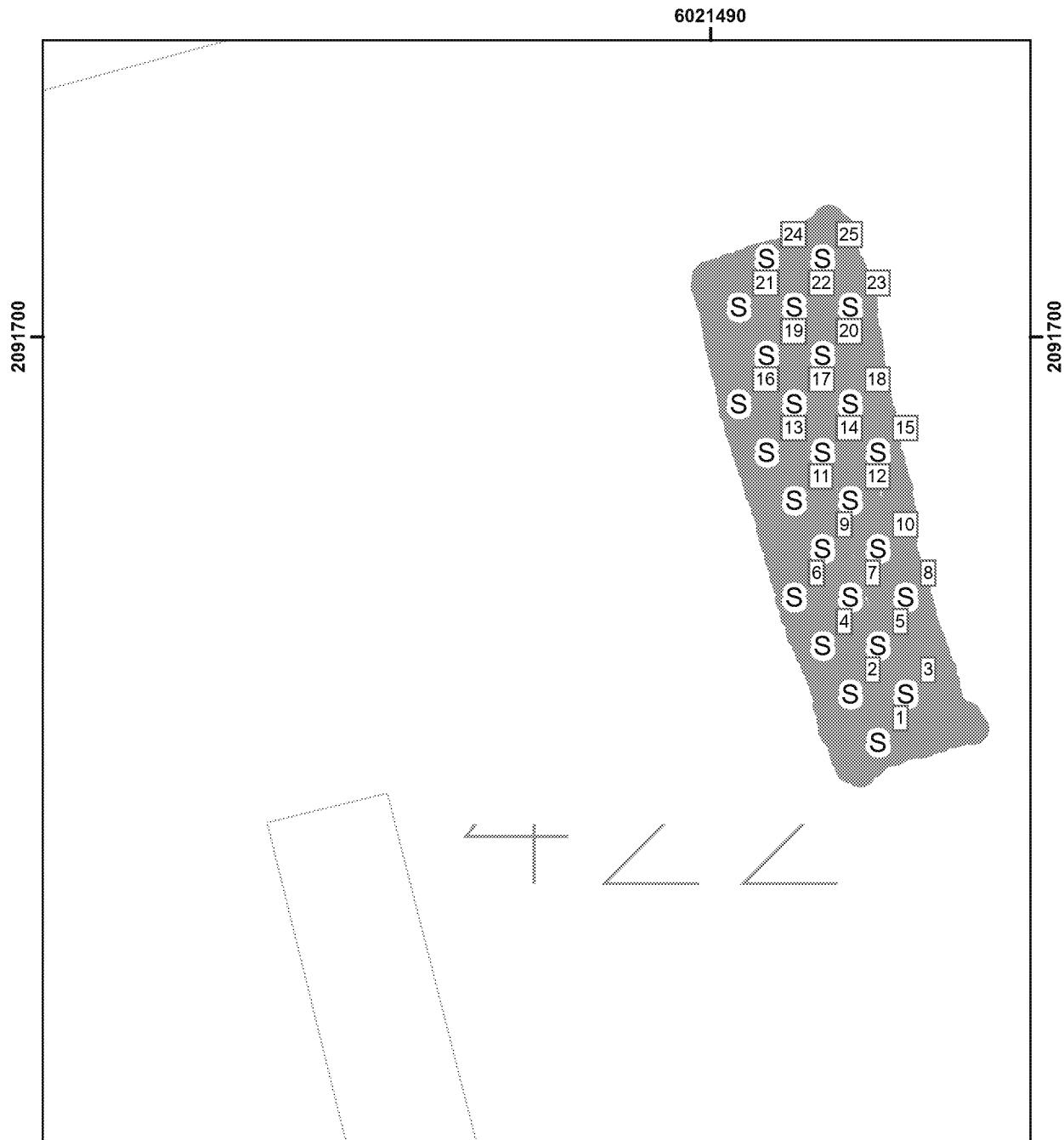
**Follow-Up Static Survey
HPNS Parcel G
RSY 11 Use 3**

TU-099C ESU



Systematic Sampling
HPNS Parcel G
RSY 11 Use 3

TU-099C ESU



RSY 11 Use 3

S Systematic Sample Locations

● RS-700 GWS Coverage

10 5 0 10 Feet

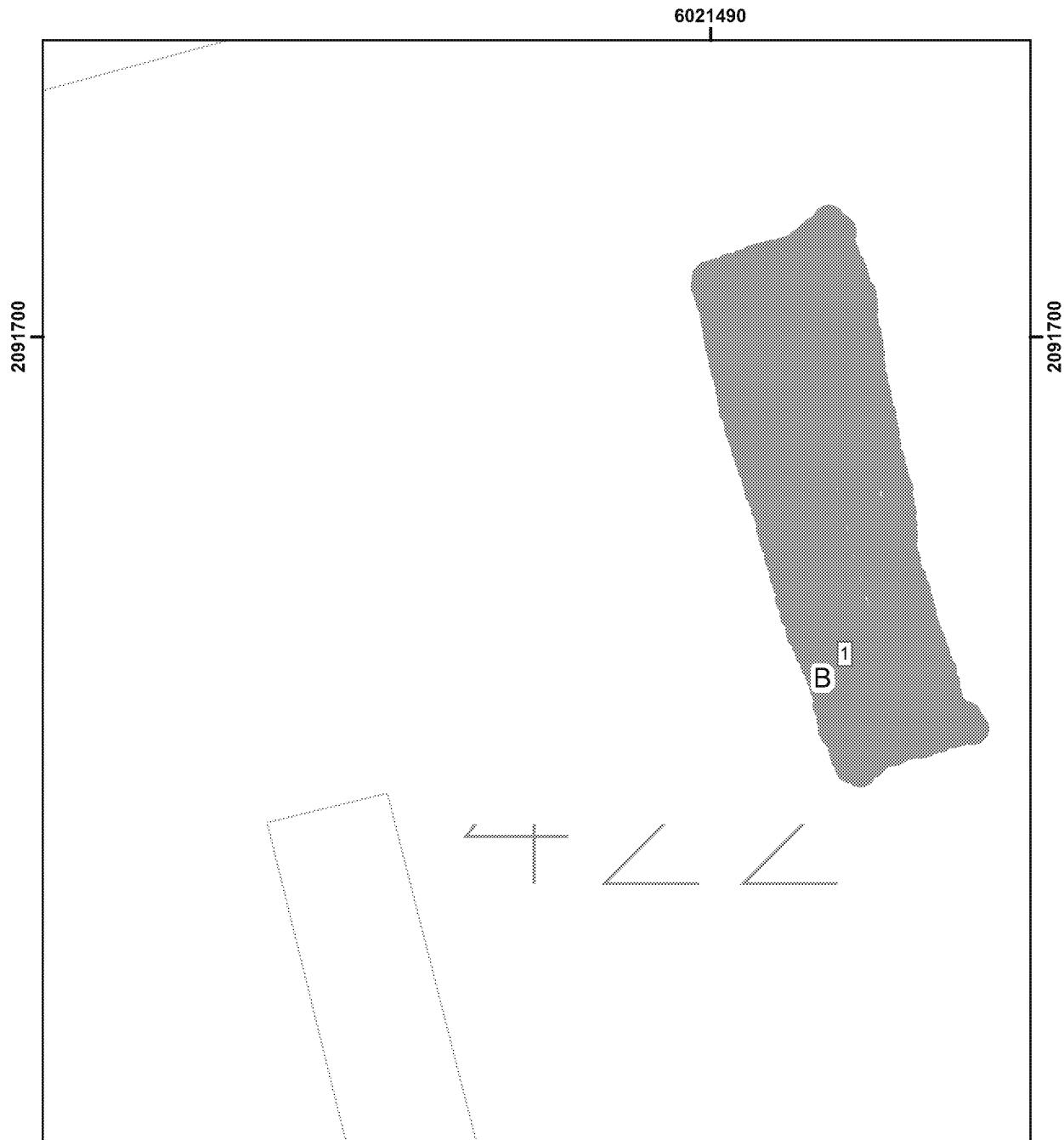
Coordinate system: CSP Zone III, NAD83, US Survey Foot



APTIM

Biased Sampling
HPNS Parcel G
RSY 11 Use 3

TU-099C ESU



RSY 11 Use 3

B Biased Sample Location

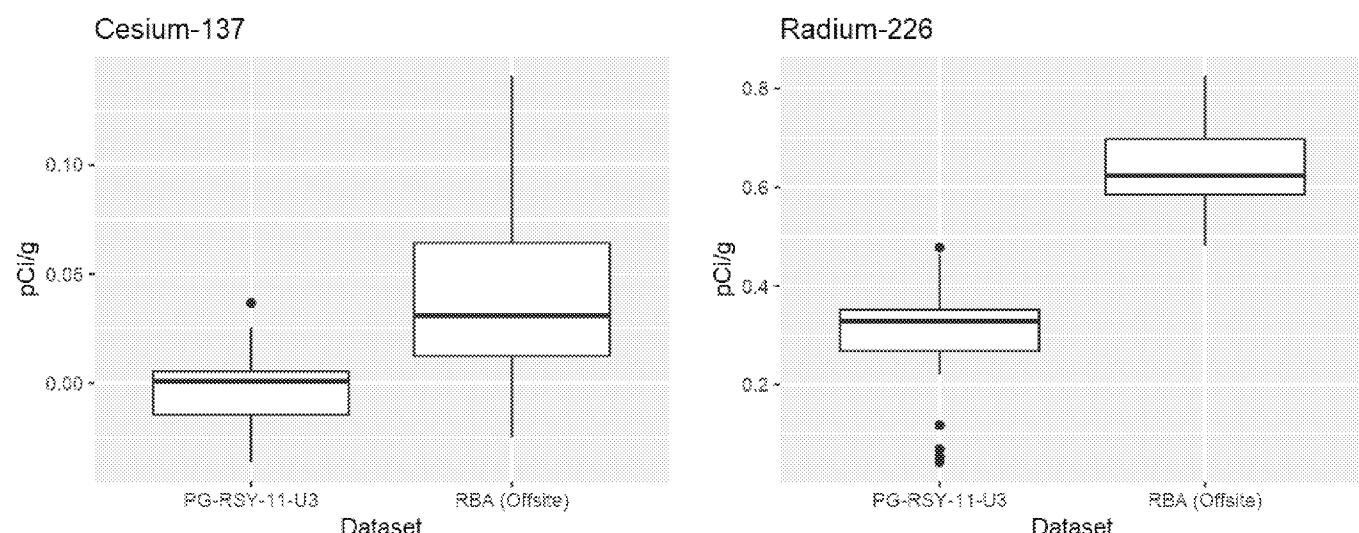
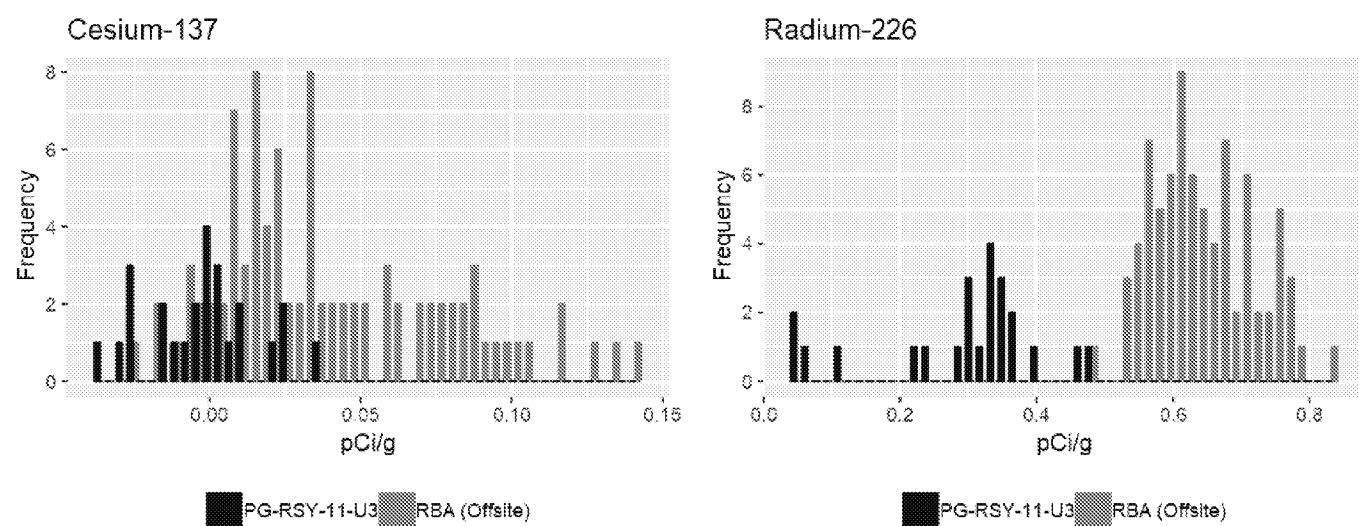
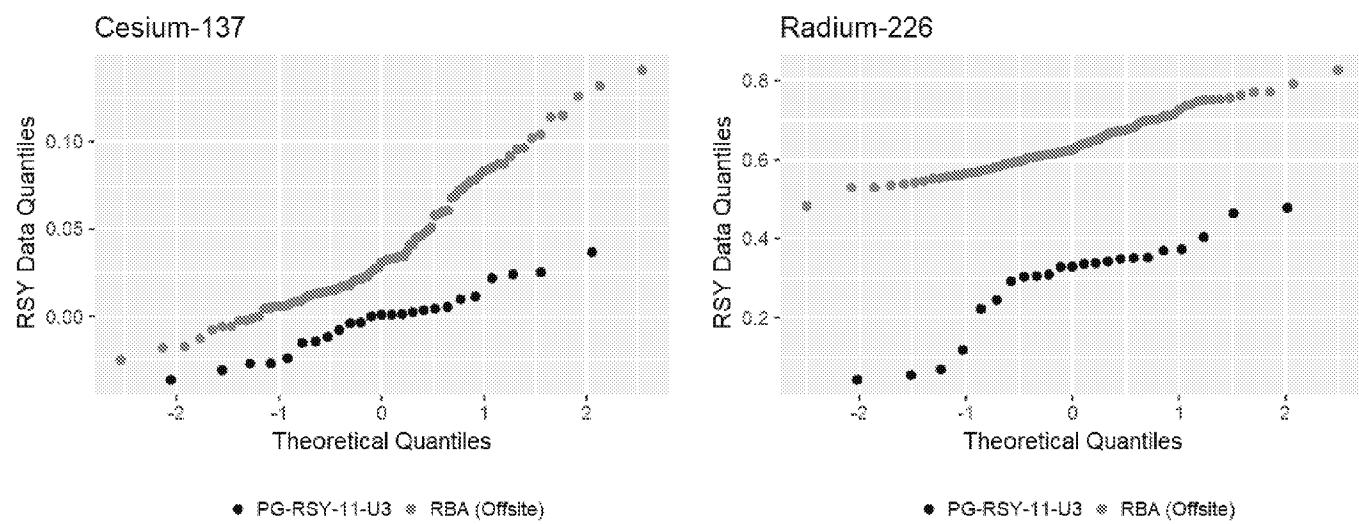
● RS-700 GWS Coverage

Coordinate system: CSP Zone III, NAD83, US Survey Foot



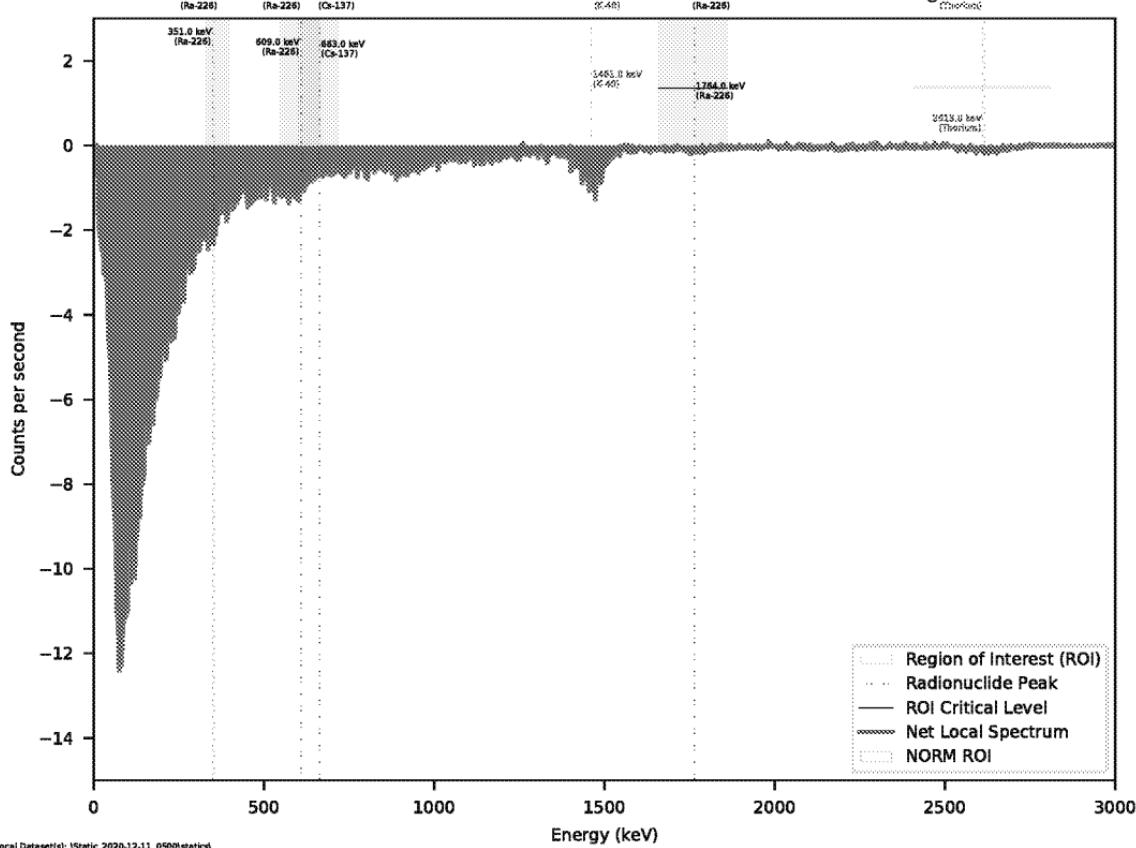
APTIM

Soil Sample Statistics



Net Gamma Spectrum, Static Location: 1

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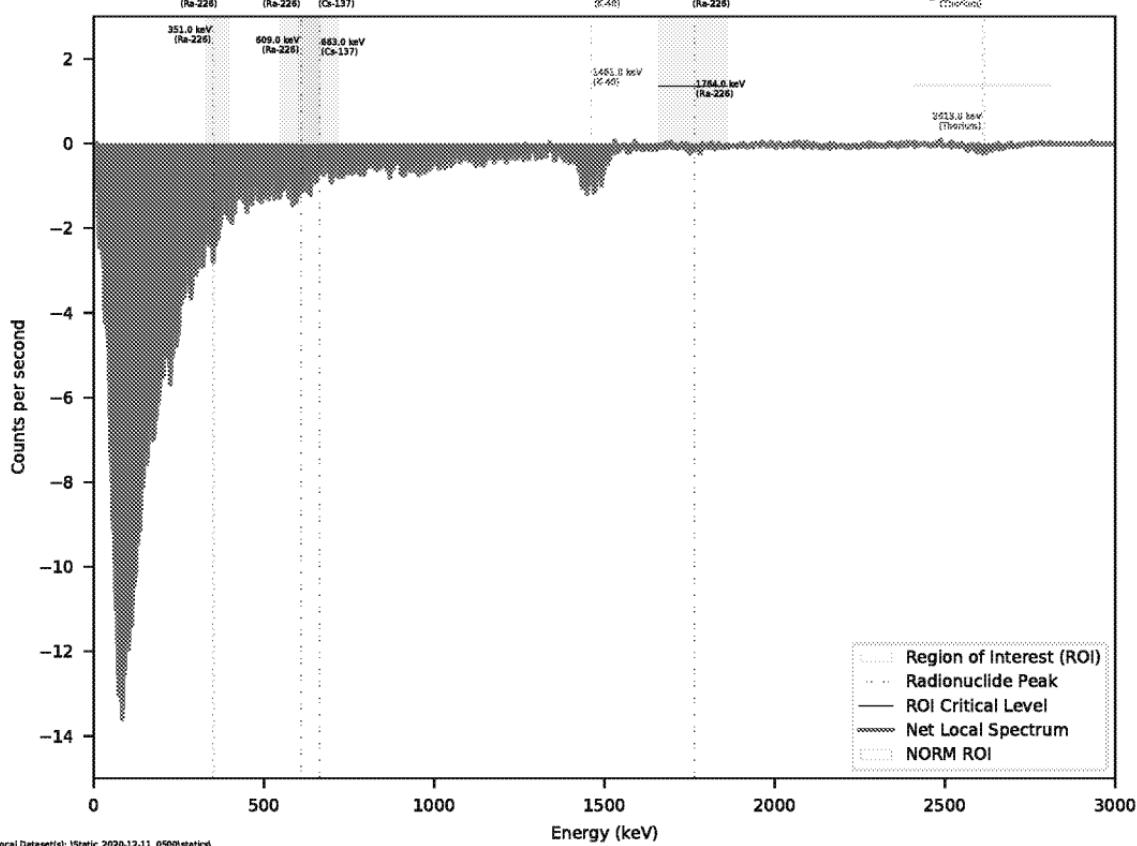
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ED_006360A_00000365-00014

Net Gamma Spectrum, Static Location: 2

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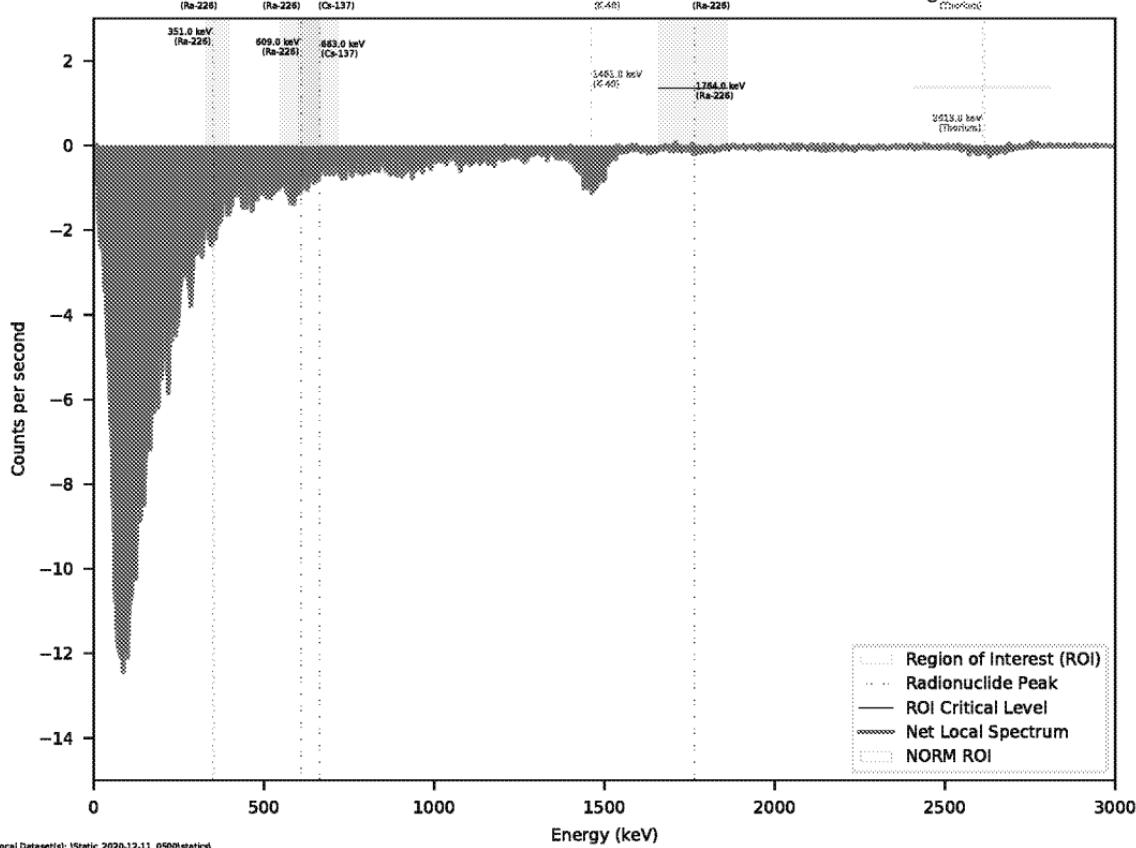
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ED_006360A_00000365-00015

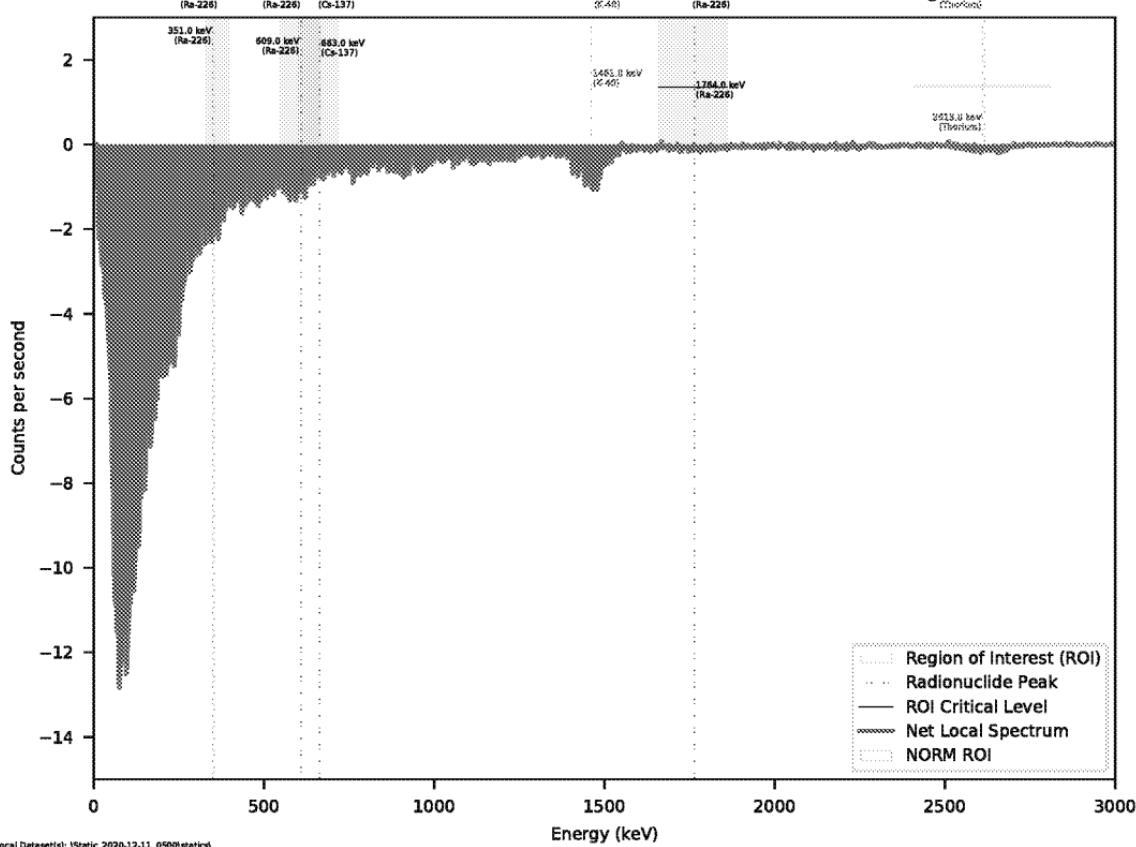
Net Gamma Spectrum, Static Location: 3

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Net Gamma Spectrum, Static Location: 4

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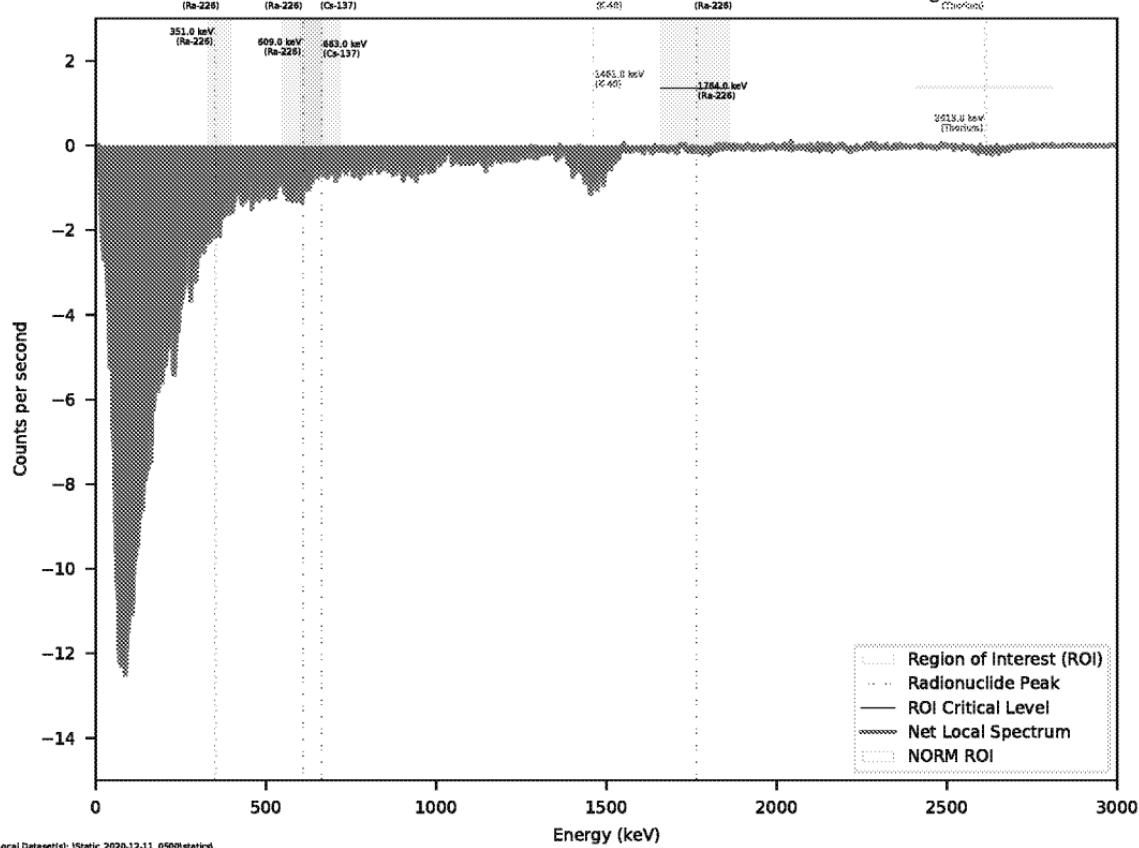
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Net Gamma Spectrum, Static Location: 5

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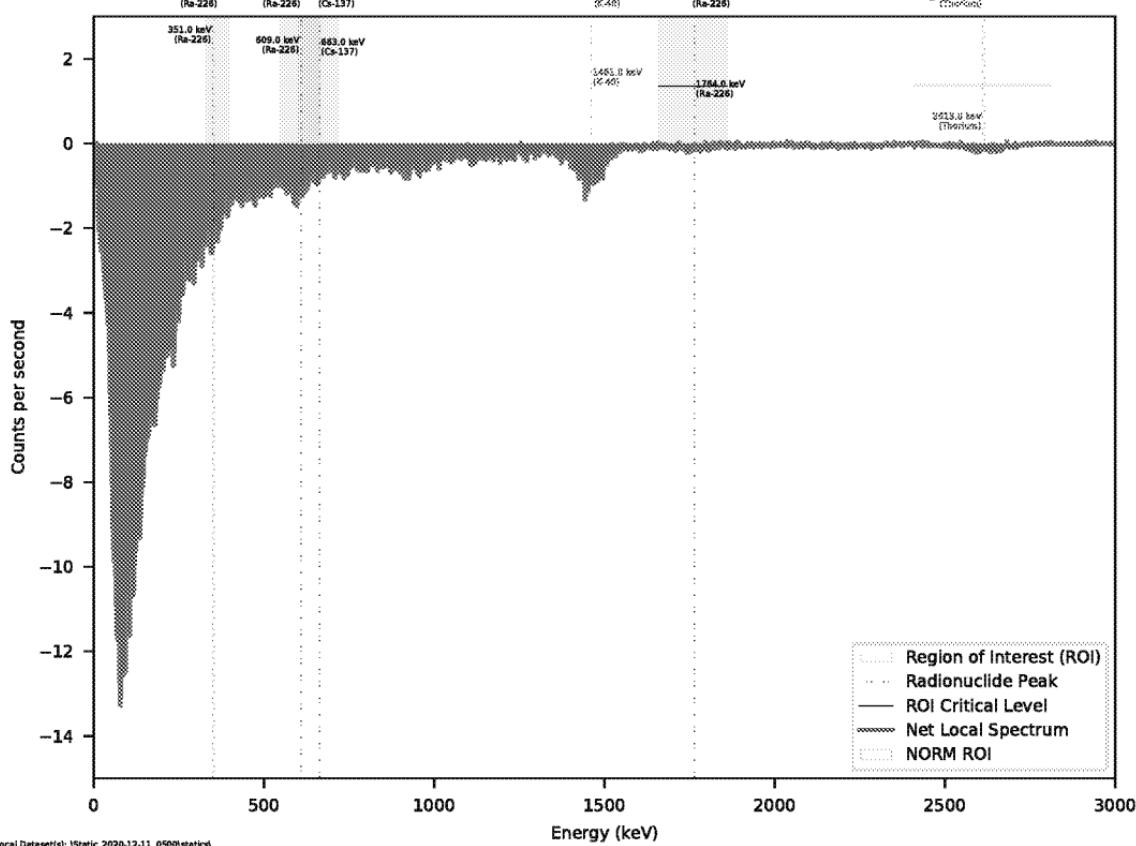
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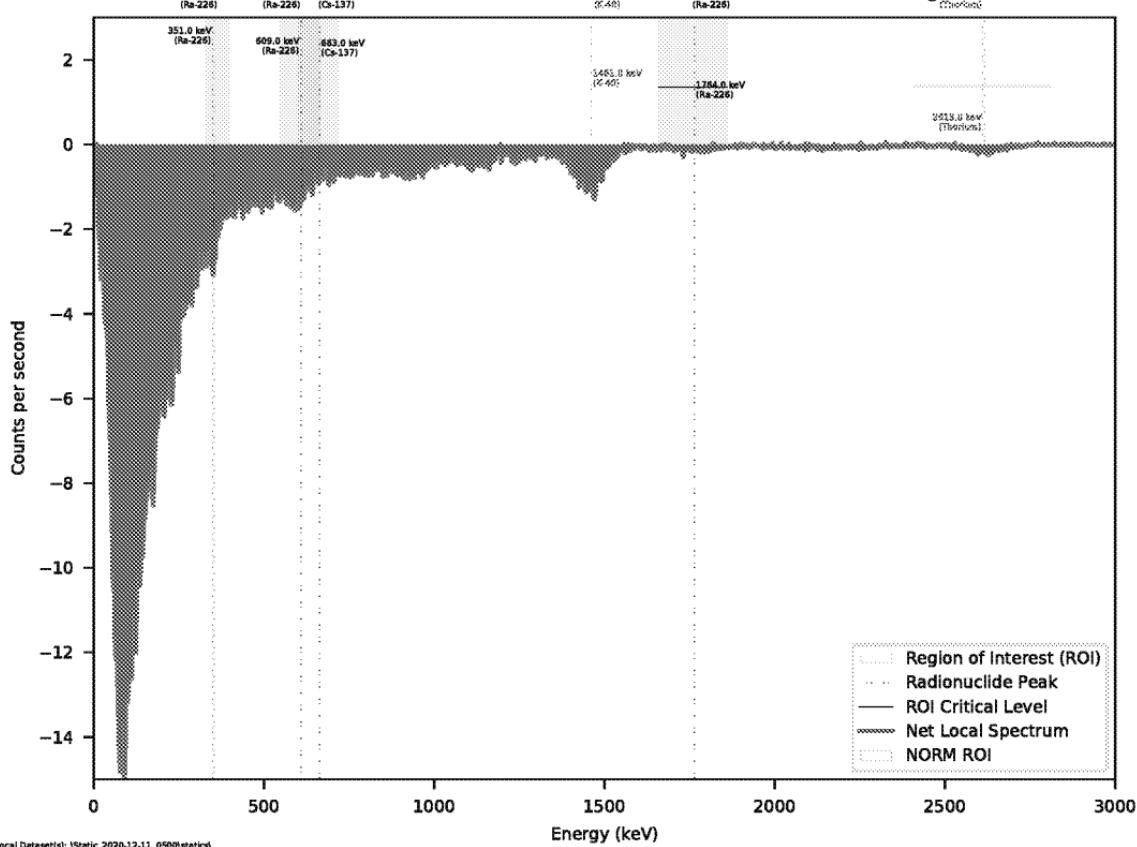
Net Gamma Spectrum, Static Location: 6

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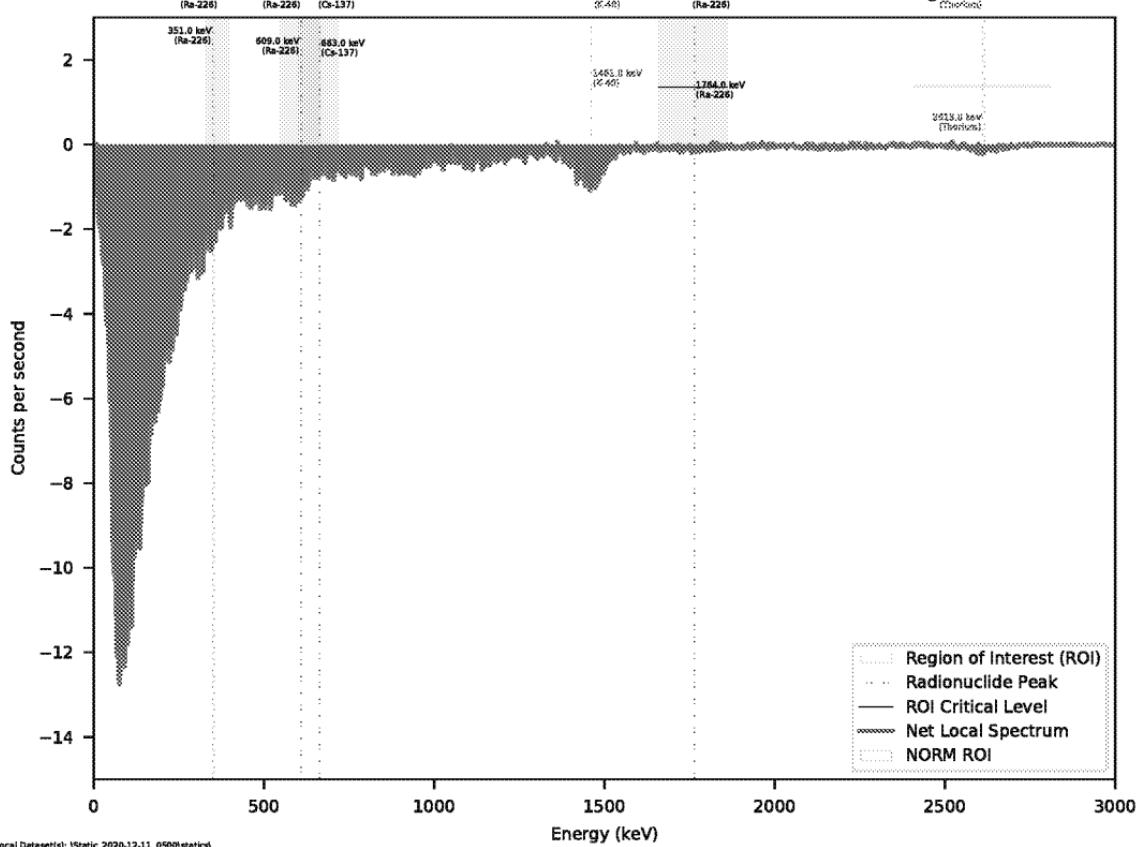
Net Gamma Spectrum, Static Location: 7

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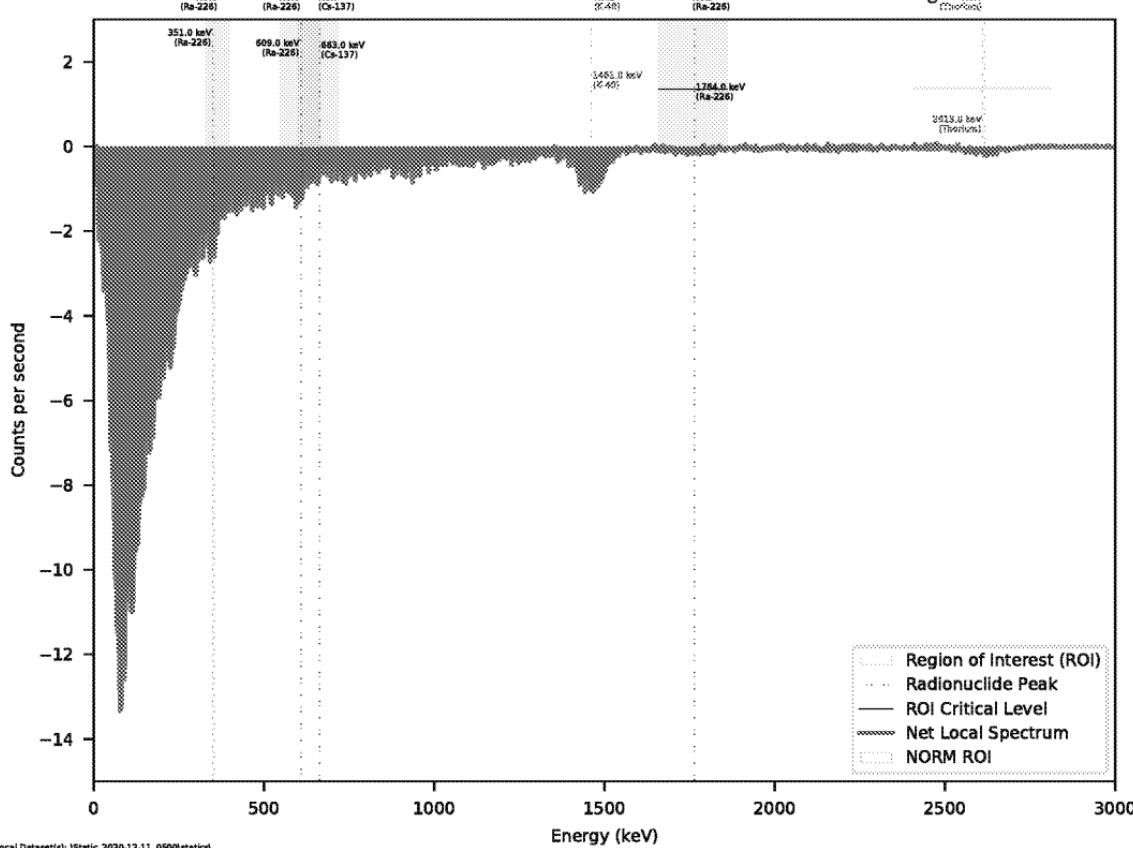
Net Gamma Spectrum, Static Location: 8

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Net Gamma Spectrum, Static Location: 9

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Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-40797-1
Laboratory Sample Delivery Group: GJ46599742
Client Project/Site: HPNS-Parcel G 501197
Revision: 1

For:
Aptim Federal Services LLC
4005 Port Chicago Hwy, Suite 200
Concord, California 94520

Attn: Rose Condit

Elizabeth M. Hoercher

Authorized for release by:
4/13/2021 3:40:34 PM
Elizabeth Hoercher, Project Manager I
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Designee for
Rhonda Ridenhower, Client Service Manager
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Rhonda.Ridenhower@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Job ID: 160-40797-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

CASE NARRATIVE

Client: Aptim Federal Services LLC

Project: HPNS-Parcel G 501197

Report Number: 160-40797-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, St. Louis attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an ""as received"" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

The matrix for the Method Blank and LCS is as close to the following samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

Revision 1- Additional information requested in case narrative for total strontium.

Case Narrative

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Job ID: 160-40797-1 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

RECEIPT

The samples were received on 12/15/2020; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 5.3 C.

STRONTIUM-90 (GFPC)

Samples HPPG-ESU-TU099C-001 (160-40797-1), HPPG-ESU-TU099C-011 (160-40797-11) and HPPG-ESU-TU099C-021 (160-40797-21) were analyzed for Strontium-90 (GFPC) in accordance with EPA 905. The samples were dried on 12/17/2020, prepared on 12/28/2020 and analyzed on 01/06/2021.

When taking small mass aliquots from dried/disaggregated sample, the laboratory avoids large rocks/pebbles (as well as sticks, etc) which may constitute a larger than representative portion of the aliquot. Smaller rocks may be included. This is consistent with QSM and Laboratory SOP. HPPG-ESU-TU099C-001 (160-40797-1), HPPG-ESU-TU099C-011 (160-40797-11) and HPPG-ESU-TU099C-021 (160-40797-21)

The method blank (MB) Z-score is within limits and is located in the level IV raw data. (MB 160-493207/23-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples HPPG-ESU-TU099C-001 (160-40797-1), HPPG-ESU-TU099C-002 (160-40797-2), HPPG-ESU-TU099C-003 (160-40797-3), HPPG-ESU-TU099C-004 (160-40797-4), HPPG-ESU-TU099C-005 (160-40797-5), HPPG-ESU-TU099C-006 (160-40797-6), HPPG-ESU-TU099C-007 (160-40797-7), HPPG-ESU-TU099C-008 (160-40797-8), HPPG-ESU-TU099C-009 (160-40797-9), HPPG-ESU-TU099C-010 (160-40797-10), HPPG-ESU-TU099C-011 (160-40797-11), HPPG-ESU-TU099C-012 (160-40797-12), HPPG-ESU-TU099C-013 (160-40797-13), HPPG-ESU-TU099C-014 (160-40797-14), HPPG-ESU-TU099C-015 (160-40797-15), HPPG-ESU-TU099C-016 (160-40797-16), HPPG-ESU-TU099C-017 (160-40797-17), HPPG-ESU-TU099C-018 (160-40797-18), HPPG-ESU-TU099C-019 (160-40797-19), HPPG-ESU-TU099C-020 (160-40797-20), HPPG-ESU-TU099C-021 (160-40797-21), HPPG-ESU-TU099C-022 (160-40797-22), HPPG-ESU-TU099C-023 (160-40797-23), HPPG-ESU-TU099C-024 (160-40797-24), HPPG-ESU-TU099C-025 (160-40797-25), HPPG-F-059 (160-40797-26) and HPPG-F-060 (160-40797-27) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were dried on 12/17/2020, prepared on 12/21/2020 and analyzed on 01/11/2021.

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from Reported to Analyte

| | |
|---------|---------|
| Th-234 | Pa-234 |
| Th-234 | U-238 |
| Pb-210 | Po-210 |
| Pb-210 | Bi-210 |
| Cs-137 | Ba-137m |
| Pb-212 | Po-216 |
| Xe-131m | Xe-131 |
| Sb-125 | Te-125m |
| Ag-108m | Ag-108 |
| Rh-106 | Ru-106 |
| Pb-212 | Th-228 |
| Pb-212 | Ra-224 |
| U-235 | Th-231 |
| Ac-228 | Th-232 |
| Ac-228 | Ra-228 |
| Th-227 | Ra-223 |
| Th-227 | Ac-227 |
| Th-227 | Bi-211 |
| Th-227 | Pb-211 |

Case Narrative

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Job ID: 160-40797-1 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

Bi-214 Ra-226

Gamma Prep Batch 492625

The method blank (MB) Z-score is within limits and is located in the level IV raw data.

Gamma prep batch 492605

The method blank (MB) z-score is within limits and is stored in the level IV raw data. (MB 160-492605/1-A)

The relative percent difference (RPD) and replicate error ratio (RER) is outside of the acceptance limits of 40%/1 for Pa-234 (197% / 1.65). Both the sample and duplicate activity were less than the MDC. The data have been reported. (160-40800-A-4-C DU)

The replicate precision for Pb-212/Th-228 associated with Prep Batch 160-492295 and 160-492605 does not meet QC criteria. This appears to be random in nature, and limited deviations such as this are statistically expected when larger analyte lists are reported. Such excursions are often caused by fluctuations in Compton background, force-fitting of peaks that are not found by the software peak-search algorithm, and inclusion of inferior peak results by the software in weighted averages. The laboratory SOP allows for such statistical exceedances. (160-40800-A-4-C DU)

The following samples exhibited a negative result greater in magnitude than the 3 sigma TPU (160-40797-18; Pb-210 and 160-40797-19; Th-234): HPPG-ESU-TU099C-018 (160-40797-18) and HPPG-ESU-TU099C-019 (160-40797-19). This occurrence was evaluated and determined to be random in nature. Sporadic occurrences such as this are statistically expected. No further action is required.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



CHAIN OF CUSTODY

Ref. Document # 501197RSY-056

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APTIM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520Project Manager: Lisa Bercik
Phone #: (619)213-3389Send Report to: Rose Condit
Phone/Fax Number: 415-987-0760
Address: 4005 Port Chicago Hwy

Sample Lead: Murri, Andrew

Sample Tech(s): Paul Leblanc
Katrina Owens
Joaquin Rodrigues

| | | | | Analysis Requested | | | | | | |
|-----------------------|------------|-------|--------|---------------------------------------------------------|-----------------|--------------------|---|-----------------|-----------------|------------|
| | | | | Standard-80 (EPA 905 MDD) | | | | | | |
| | | | | Ground Spec (EPA 901.1 M) - Full 21 day In growth gamma | | | | | | |
| | | | | Gamma Spec (EPA 901.1 M) - Full 21 day In growth gamma | | | | Dose Rate uR/Hr | Evidence Bag ID | Comment |
| Lab Contact Name/ph # | | | | Rhoeda Ridenbower (314)298-8566 | | | | | | |
| | | | | Preservatives (water) | | | | | | |
| | | | | Preservatives (soil) | | | | | | |
| Sample ID | Date | Time | Method | Matrix | # of Containers | Container Type | | | | |
| HPPG-ESU-TU099C-001 | 12/12/2020 | 09:26 | G | SO | 1 | 16 oz. plastic jar | X | X | 4 | GJ46599742 |
| HPPG-ESU-TU099C-002 | 12/12/2020 | 09:37 | G | SO | 1 | 16 oz. plastic jar | X | | 4 | GJ46599742 |
| HPPG-ESU-TU099C-003 | 12/12/2020 | 09:35 | G | SO | 1 | 16 oz. plastic jar | X | | 4 | GJ46599742 |
| HPPG-ESU-TU099C-004 | 12/12/2020 | 09:40 | G | SO | 1 | 16 oz. plastic jar | X | | 4 | GJ46599742 |
| HPPG-ESU-TU099C-005 | 12/12/2020 | 09:43 | G | SO | 1 | 16 oz. plastic jar | X | | 4 | GJ46599742 |
| HPPG-ESU-TU099C-006 | 12/12/2020 | 09:45 | G | SO | 1 | 16 oz. plastic jar | X | | 4 | GJ46599742 |
| HPPG-ESU-TU099C-007 | 12/12/2020 | 09:47 | G | SO | 1 | 16 oz. plastic jar | X | | 4 | GJ46599742 |
| HPPG-ESU-TU099C-008 | 12/12/2020 | 09:51 | G | SO | 1 | 16 oz. plastic jar | X | | 4 | GJ46599742 |

Special Instructions:

21 day ingrowth results only

| | | | | | | | | | |
|-------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|-----------------------|----------------------------|-----------------------------|------------------------------|------------------|
| Turanaround Time: | 3-day <input type="checkbox"/> | 10-Day <input type="checkbox"/> | 28-day <input type="checkbox"/> | Other <input type="checkbox"/> | Level of QC Required: | I <input type="checkbox"/> | II <input type="checkbox"/> | III <input type="checkbox"/> | Project Specific |
|-------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|-----------------------|----------------------------|-----------------------------|------------------------------|------------------|

Method Codes C = Composite G = Grab Matrix Codes: DW = Drinking Water; So = Soil; GW = Ground Water; SL = Sludge; WW = Waste Water; CP = Chip Samples; A = Air; ABS = Asbestos; PO = Pipe Opening

Relinquished By: Relinquisher Signature: Relinquish Date Time: Received By: Received Signature: Receive Date Time:

| | | | | | |
|----------------------------|--|------------------|------------------------------|--|------------------|
| Murri, Andrew | | 12/12/2020 14:57 | Locked Storage (RKillpack) | | 12/12/2020 14:57 |
| Locked Storage (RKillpack) | | 12/14/2020 10:14 | Andrew Murri | | 12/14/2020 10:14 |
| Andrew Murri | | 12/14/2020 10:22 | VIA SHIPPED TO LAB FED EX | | 12/14/2020 10:22 |

*** Last 3 transfers shown above - Complete list of transfers on last page ***

MICHAEL KORRINIZER

12/14/2020



ED_006360A_00000365-00028



CHAIN OF CUSTODY

Ref. Document # 501197RSY-056

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APTIM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520Project Manager: Lisa Berlek
Phone #: (619)213-3389Send Report to: Rose Condit
Phone/Fax Number: 419-987-0760
Address: 4005 Port Chicago Hwy
City: Concord, CA 94520

Sample Lead: Murri, Andrew

Sample Tech(s): Paul Leblanc
Katrina Owens
Joaquin Rodrigues

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4/13/2021 (Rev. 1)

| | | | | Analysis Requested | | | | Dose Rate uR/Hr | Evidence Bag ID | Comment |
|---------------------|------------|-------|--------|-----------------------------------|----------------------------|-----------------------|----------------------|--------------------|-----------------|---------|
| | | | | Gamma Spec EPA 901.1(M) - Full 21 | Strontium-90 (EPA 905 M0D) | | | | | |
| | | | | day by ground sample | | | | | | |
| Sample ID | Date | Time | Method | Matrix | # of Containers | Preservatives (water) | Preservatives (soil) | Container Type | | |
| HPPG-ESU-TU099C-009 | 12/12/2020 | 09:55 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-010 | 12/12/2020 | 09:59 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-011 | 12/12/2020 | 10:08 | G | SO | 1 | 16 oz. plastic jar | | X | X | 4 |
| HPPG-ESU-TU099C-012 | 12/12/2020 | 10:15 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-013 | 12/12/2020 | 10:25 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-014 | 12/12/2020 | 10:34 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-015 | 12/12/2020 | 10:44 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-016 | 12/12/2020 | 10:53 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-017 | 12/12/2020 | 11:03 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-018 | 12/12/2020 | 11:12 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-019 | 12/12/2020 | 11:21 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-020 | 12/12/2020 | 11:32 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-021 | 12/12/2020 | 11:39 | G | SO | 1 | 16 oz. plastic jar | | X | X | 4 |
| HPPG-ESU-TU099C-022 | 12/12/2020 | 11:50 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-023 | 12/12/2020 | 12:01 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-024 | 12/12/2020 | 12:12 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |
| HPPG-ESU-TU099C-025 | 12/12/2020 | 12:35 | G | SO | 1 | 16 oz. plastic jar | | X | | 4 |



CHAIN OF CUSTODY

Ref. Document # 501197RSY-056

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APTIM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520Project Manager: Lisa Berck
Phone #: (619)213-3389Send Report to: Rose Condit
Phone/Fax Number: 415-987-0780
Address: 4005 Port Chicago Hwy
City: Concord, CA 94520

Sample Lead: Murri, Andrew

Sample Tech(s): Paul Leblanc
Katrina Owens
Joaquin Rodrigues

Project Number: 501197

Hunters Point Naval Shipyard: Parcel
G Remedial Action

Project Location: San Francisco, CA

Purchase Order #: 1159058

Shipment/Pickup Date: 12/14/2020

Waybill Number: 415-97-0225 Q103

Test America (St. Louis Lab)

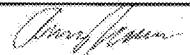
Lab Destination: 13715 Rider Trail North
Earth City, MO 63046

Lab Contact Name/ph # Rhoeda Ridenbower (314)298-8566

| | Collection Information | | | | Matrix | # of Containers | Preservatives (water) | Preservatives (soil) | Container Type | 16 oz. plastic jar | X | 4 | GJ46599742 | Evidence Bag ID | Comment | |
|------------|------------------------|-------|--------|----|--------|-----------------|-----------------------|----------------------|----------------|--------------------|---|---|------------|-----------------|---------|--|
| Sample ID | Date | Time | Method | SO | | | | | | | | | | | | |
| HPPG-F-059 | 12/12/2020 | 12:35 | G | SO | | 1 | | | | | | | | | | |
| HPPG-F-060 | 12/12/2020 | 09:55 | G | SO | | 1 | | | | | | | | | | |



All Transfers for COC 501197RSY-056

| Relinquished By: | Relinquisher Signature: | Relinquish Date Time: | Received By: | Received Signature: | Receive Date Time: |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------|----------------------------|--------------------------------------------------------------------------------------------------------|---------------------|
| Murri, Andrew |  | 12/12/2020 14:57 | Locked Storage (RKillpack) |  | 12/12/2020 14:57 |
| Locked Storage (RKillpack) |  | 12/14/2020 10:14 | Andrew Murri |  | 12/14/2020 10:14 |
| Andrew Murri |  | 12/14/2020 10:22 | SHIPPEDTOLAB via FEDEX |  MICHA KORRINZER | 12/15/2020 09:24 |

Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-40797-1
SDG Number: GJ46599742**Login Number: 40797****List Number: 1****Creator: Korrinhizer, Micha L****List Source: Eurofins TestAmerica, St. Louis**

| Question | Answer | Comment |
|----------------------------------------------------------------------------------|--------|---------|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | N/A | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

Definitions/Glossary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Qualifiers

| Rad Qualifier | Qualifier Description |
|---------------|---------------------------------------|
| U | Undetected at the Limit of Detection. |

Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|----------------|-------------------------------------------------------------------------------------------------------------|
| % | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

Method Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

| Method | Method Description | Protocol | Laboratory |
|---------------|-----------------------------------------------------------------|----------|------------|
| 905 | Strontium-90 (GFPC) | EPA | TAL SL |
| GA-01-R | Radium-226 & Other Gamma Emitters (GS) | DOE | TAL SL |
| DPS-7 | Preparation, Digestion/Precipitate Separation (7-Day In-Growth) | None | TAL SL |
| Dry and Grind | Preparation, Dry and Grind | None | TAL SL |
| Fill_Geo-21 | Fill Geometry, 21-Day In-Growth | None | TAL SL |

Protocol References:

DOE = U.S. Department of Energy

EPA = US Environmental Protection Agency

None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Eurofins TestAmerica, St. Louis

Sample Summary

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---------------|---------------------|--------|----------------|----------------|----------|
| 160-40797-1 | HPPG-ESU-TU099C-001 | Solid | 12/12/20 09:26 | 12/15/20 09:24 | |
| 160-40797-2 | HPPG-ESU-TU099C-002 | Solid | 12/12/20 09:37 | 12/15/20 09:24 | |
| 160-40797-3 | HPPG-ESU-TU099C-003 | Solid | 12/12/20 09:35 | 12/15/20 09:24 | |
| 160-40797-4 | HPPG-ESU-TU099C-004 | Solid | 12/12/20 09:40 | 12/15/20 09:24 | |
| 160-40797-5 | HPPG-ESU-TU099C-005 | Solid | 12/12/20 09:43 | 12/15/20 09:24 | |
| 160-40797-6 | HPPG-ESU-TU099C-006 | Solid | 12/12/20 09:45 | 12/15/20 09:24 | |
| 160-40797-7 | HPPG-ESU-TU099C-007 | Solid | 12/12/20 09:47 | 12/15/20 09:24 | |
| 160-40797-8 | HPPG-ESU-TU099C-008 | Solid | 12/12/20 09:51 | 12/15/20 09:24 | |
| 160-40797-9 | HPPG-ESU-TU099C-009 | Solid | 12/12/20 09:55 | 12/15/20 09:24 | |
| 160-40797-10 | HPPG-ESU-TU099C-010 | Solid | 12/12/20 09:59 | 12/15/20 09:24 | |
| 160-40797-11 | HPPG-ESU-TU099C-011 | Solid | 12/12/20 10:08 | 12/15/20 09:24 | |
| 160-40797-12 | HPPG-ESU-TU099C-012 | Solid | 12/12/20 10:15 | 12/15/20 09:24 | |
| 160-40797-13 | HPPG-ESU-TU099C-013 | Solid | 12/12/20 10:25 | 12/15/20 09:24 | |
| 160-40797-14 | HPPG-ESU-TU099C-014 | Solid | 12/12/20 10:34 | 12/15/20 09:24 | |
| 160-40797-15 | HPPG-ESU-TU099C-015 | Solid | 12/12/20 10:44 | 12/15/20 09:24 | |
| 160-40797-16 | HPPG-ESU-TU099C-016 | Solid | 12/12/20 10:53 | 12/15/20 09:24 | |
| 160-40797-17 | HPPG-ESU-TU099C-017 | Solid | 12/12/20 11:03 | 12/15/20 09:24 | |
| 160-40797-18 | HPPG-ESU-TU099C-018 | Solid | 12/12/20 11:12 | 12/15/20 09:24 | |
| 160-40797-19 | HPPG-ESU-TU099C-019 | Solid | 12/12/20 11:21 | 12/15/20 09:24 | |
| 160-40797-20 | HPPG-ESU-TU099C-020 | Solid | 12/12/20 11:32 | 12/15/20 09:24 | |
| 160-40797-21 | HPPG-ESU-TU099C-021 | Solid | 12/12/20 11:39 | 12/15/20 09:24 | |
| 160-40797-22 | HPPG-ESU-TU099C-022 | Solid | 12/12/20 11:50 | 12/15/20 09:24 | |
| 160-40797-23 | HPPG-ESU-TU099C-023 | Solid | 12/12/20 12:01 | 12/15/20 09:24 | |
| 160-40797-24 | HPPG-ESU-TU099C-024 | Solid | 12/12/20 12:12 | 12/15/20 09:24 | |
| 160-40797-25 | HPPG-ESU-TU099C-025 | Solid | 12/12/20 12:35 | 12/15/20 09:24 | |
| 160-40797-26 | HPPG-F-059 | Solid | 12/12/20 12:35 | 12/15/20 09:24 | |
| 160-40797-27 | HPPG-F-060 | Solid | 12/12/20 09:55 | 12/15/20 09:24 | |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-001

Lab Sample ID: 160-40797-1

Matrix: Solid

Date Collected: 12/12/20 09:26
Date Received: 12/15/20 09:24

Method: 905 - Strontium-90 (GFPC)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|----------------|---------------|------------------|--------------------|--------------------|-------|-------|-------|-----------------|-----------------|----------------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Strontium-90 | 0.0926 | U | 0.168 | 0.169 | 0.331 | 0.132 | pCi/g | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| Carrier | %Yield | Qualifier | Limits | | | | | Prepared | Analyzed | Dil Fac |
| Sr Carrier | 94.2 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| Y Carrier | 89.7 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|--------------------|--------------------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Actinium 228 | 0.327 | | 0.114 | 0.119 | | 0.0392 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Actinium-227 | -0.136 | U | 0.275 | 0.275 | | 0.248 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Bismuth-212 | 0.0130 | U | 0.463 | 0.463 | | 0.381 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Bismuth-214 | 0.309 | | 0.0897 | 0.0953 | | 0.0310 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Cesium-137 | -0.0152 | U | 0.0332 | 0.0332 | 0.0700 | 0.0304 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Lead-210 | 0.457 | U | 1.01 | 1.01 | | 0.812 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Lead-212 | 0.190 | | 0.0539 | 0.0592 | | 0.0302 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Lead-214 | 0.299 | | 0.0652 | 0.0722 | | 0.0285 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Potassium-40 | 6.62 | | 0.953 | 1.17 | | 0.208 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Protactinium-231 | -0.602 | U | 1.83 | 1.83 | | 1.48 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Protactinium-234 | 0.0576 | U | 0.165 | 0.165 | | 0.134 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Radium-226 | 0.309 | | 0.0897 | 0.0953 | 0.200 | 0.0310 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Radium-228 | 0.327 | | 0.114 | 0.119 | | 0.0392 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Thallium-208 | 0.117 | | 0.0458 | 0.0474 | | 0.0154 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Thorium 228 | 0.190 | | 0.0539 | 0.0592 | | 0.0302 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Thorium-232 | 0.327 | | 0.114 | 0.119 | | 0.0392 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Thorium-234 | 0.0517 | U | 0.377 | 0.377 | | 0.627 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Uranium-235 | -0.0178 | U | 0.0310 | 0.0310 | | 0.291 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |
| Uranium-238 | 0.0517 | U | 0.377 | 0.377 | | 0.627 | pCi/g | 12/21/20 11:11 | 01/11/21 07:09 | 1 |

Client Sample ID: HPPG-ESU-TU099C-002

Lab Sample ID: 160-40797-2

Matrix: Solid

Date Collected: 12/12/20 09:37
Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|--------------------|--------------------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Actinium 228 | 0.384 | | 0.127 | 0.133 | | 0.0527 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Actinium-227 | 0.0819 | U | 0.515 | 0.515 | | 0.316 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Bismuth-212 | 0.386 | U | 0.760 | 0.761 | | 0.590 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Bismuth-214 | 0.303 | | 0.107 | 0.112 | | 0.0535 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Cesium-137 | -0.0239 | U | 0.0668 | 0.0669 | 0.0700 | 0.0530 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Lead-210 | 0.965 | | 1.27 | 1.27 | | 0.873 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Lead-212 | 0.313 | | 0.0827 | 0.0890 | | 0.0437 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Lead-214 | 0.343 | | 0.114 | 0.119 | | 0.0581 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Potassium-40 | 9.36 | | 1.36 | 1.65 | | 0.115 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Protactinium-231 | 0.000 | U | 0.276 | 0.276 | | 2.06 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-002
Date Collected: 12/12/20 09:37
Date Received: 12/15/20 09:24

Lab Sample ID: 160-40797-2
Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|--------|-----------|---------|---------|-------|--------|-------|----------------|----------------|----------------|
| | | | Uncert. | (2σ+/-) | | | | | | |
| Protactinium-234 | -0.102 | U | | 0.308 | 0.308 | | 0.251 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 |
| Radium-226 | 0.303 | | 0.107 | 0.112 | 0.200 | 0.0535 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Radium-228 | 0.384 | | 0.127 | 0.133 | | 0.0527 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Thallium-208 | 0.149 | | 0.0480 | 0.0504 | | 0.0124 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Thorium 228 | 0.313 | | 0.0827 | 0.0890 | | 0.0437 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Thorium-232 | 0.384 | | 0.127 | 0.133 | | 0.0527 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Thorium-234 | -0.369 | U | 0.988 | 0.988 | | 0.802 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Uranium-235 | 0.185 | U | 0.404 | 0.405 | | 0.491 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |
| Uranium-238 | -0.369 | U | 0.988 | 0.988 | | 0.802 | pCi/g | 12/21/20 11:11 | 01/11/21 07:10 | 1 |

Client Sample ID: HPPG-ESU-TU099C-003

Lab Sample ID: 160-40797-3

Date Collected: 12/12/20 09:35

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|---------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. | (2σ+/-) | | | | | | |
| Actinium 228 | 0.267 | | 0.120 | 0.123 | | 0.0408 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Actinium-227 | 0.101 | U | 0.216 | 0.216 | | 0.216 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Bismuth-212 | -0.148 | U | 0.568 | 0.568 | | 0.457 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Bismuth-214 | 0.338 | | 0.0850 | 0.0919 | | 0.0293 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Cesium-137 | 0.0114 | | 0.0227 | 0.0227 | 0.0700 | 0.0112 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Lead-210 | -0.0293 | U | 1.03 | 1.03 | | 0.848 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Lead-212 | 0.242 | | 0.0504 | 0.0593 | | 0.0206 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Lead-214 | 0.284 | | 0.0627 | 0.0693 | | 0.0309 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Potassium-40 | 7.77 | | 0.981 | 1.26 | | 0.0721 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Protactinium-231 | 0.000 | U | 0.384 | 0.384 | | 1.40 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Protactinium-234 | 0.0777 | U | 0.155 | 0.155 | | 0.152 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Radium-226 | 0.338 | | 0.0850 | 0.0919 | 0.200 | 0.0293 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Radium-228 | 0.267 | | 0.120 | 0.123 | | 0.0408 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Thallium-208 | 0.138 | | 0.0410 | 0.0434 | | 0.0126 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Thorium 228 | 0.242 | | 0.0504 | 0.0593 | | 0.0206 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Thorium-232 | 0.267 | | 0.120 | 0.123 | | 0.0408 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Thorium-234 | -0.264 | U | 0.604 | 0.604 | | 0.489 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Uranium-235 | 0.000 | U | 0.120 | 0.120 | | 0.265 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |
| Uranium-238 | -0.264 | U | 0.604 | 0.604 | | 0.489 | pCi/g | 12/21/20 11:11 | 01/11/21 07:11 | 1 |

Client Sample ID: HPPG-ESU-TU099C-004

Lab Sample ID: 160-40797-4

Date Collected: 12/12/20 09:40

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------|--------|-----------|---------|---------|-----|-------|-------|----------------|----------------|---------|
| | | | Uncert. | (2σ+/-) | | | | | | |
| Actinium 228 | 0.266 | | 0.180 | 0.182 | | 0.125 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Actinium-227 | 0.137 | U | 0.242 | 0.242 | | 0.258 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-004

Lab Sample ID: 160-40797-4

Date Collected: 12/12/20 09:40

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Bismuth-212 | -0.294 | U | 0.681 | 0.682 | | 0.537 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Bismuth-214 | 0.244 | | 0.0991 | 0.102 | | 0.0389 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Cesium-137 | -0.0117 | U | 0.0484 | 0.0484 | 0.0700 | 0.0387 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Lead-210 | 0.209 | U | 1.18 | 1.18 | | 0.955 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Lead-212 | 0.204 | | 0.0690 | 0.0739 | | 0.0435 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Lead-214 | 0.334 | | 0.0890 | 0.0955 | | 0.0285 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Potassium-40 | 7.27 | | 1.19 | 1.41 | | 0.181 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Protactinium-231 | -0.0000001 | U | 1.95 | 1.95 | | 1.61 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| | 65 | | | | | | | | | |
| Protactinium-234 | -0.0186 | U | 0.169 | 0.169 | | 0.138 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Radium-226 | 0.244 | | 0.0991 | 0.102 | 0.200 | 0.0389 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Radium-228 | 0.266 | | 0.180 | 0.182 | | 0.125 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Thallium-208 | 0.0803 | | 0.0554 | 0.0560 | | 0.0266 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Thorium 228 | 0.204 | | 0.0690 | 0.0739 | | 0.0435 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Thorium-232 | 0.266 | | 0.180 | 0.182 | | 0.125 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Thorium-234 | -0.809 | U | 0.483 | 0.492 | | 1.09 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Uranium-235 | 0.0872 | U | 0.153 | 0.154 | | 0.239 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |
| Uranium-238 | -0.809 | U | 0.483 | 0.492 | | 1.09 | pCi/g | 12/21/20 11:11 | 01/11/21 07:24 | 1 |

Client Sample ID: HPPG-ESU-TU099C-005

Lab Sample ID: 160-40797-5

Date Collected: 12/12/20 09:43

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.197 | | 0.0788 | 0.0814 | | 0.108 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Actinium-227 | 0.235 | | 0.391 | 0.392 | | 0.231 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Bismuth-212 | -0.273 | U | 1.12 | 1.12 | | 0.491 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Bismuth-214 | 0.0537 | U | 0.153 | 0.153 | | 0.149 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Cesium-137 | -0.0362 | U | 0.0621 | 0.0622 | 0.0700 | 0.0484 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Lead-210 | -0.560 | U | 1.42 | 1.42 | | 1.19 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Lead-212 | 0.269 | | 0.0699 | 0.0781 | | 0.0366 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Lead-214 | 0.331 | | 0.0970 | 0.103 | | 0.0514 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Potassium-40 | 7.40 | | 1.14 | 1.36 | | 0.237 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Protactinium-231 | 0.379 | U | 1.34 | 1.34 | | 1.46 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Protactinium-234 | -0.0816 | U | 0.202 | 0.202 | | 0.163 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Radium-226 | 0.0537 | U | 0.153 | 0.153 | 0.200 | 0.149 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Radium-228 | 0.197 | | 0.0788 | 0.0814 | | 0.108 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Thallium-208 | 0.167 | | 0.0510 | 0.0539 | | 0.0175 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Thorium 228 | 0.269 | | 0.0699 | 0.0781 | | 0.0366 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Thorium-232 | 0.197 | | 0.0788 | 0.0814 | | 0.108 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Thorium-234 | -0.194 | U | 0.723 | 0.723 | | 0.600 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Uranium-235 | 0.100 | U | 0.256 | 0.256 | | 0.206 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |
| Uranium-238 | -0.194 | U | 0.723 | 0.723 | | 0.600 | pCi/g | 12/21/20 11:11 | 01/11/21 07:23 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-006

Lab Sample ID: 160-40797-6

Date Collected: 12/12/20 09:45
Date Received: 12/15/20 09:24

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.271 | | 0.224 | 0.226 | | 0.108 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Actinium-227 | 0.0408 | U | 0.164 | 0.164 | | 0.275 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Bismuth-212 | 0.0521 | U | 0.801 | 0.801 | | 0.656 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Bismuth-214 | 0.351 | | 0.118 | 0.124 | | 0.0502 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Cesium-137 | -0.00380 | U | 0.0529 | 0.0529 | 0.0700 | 0.0404 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Lead-210 | 0.0620 | U | | 1.25 | | 1.02 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Lead-212 | 0.291 | | 0.0770 | 0.0858 | | 0.0430 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Lead-214 | 0.269 | | 0.101 | 0.105 | | 0.0661 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Potassium-40 | 7.13 | | 1.14 | 1.35 | | 0.251 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Protactinium-231 | 0.000 | U | 0.473 | 0.473 | | 1.79 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Protactinium-234 | 0.0658 | U | 0.158 | 0.158 | | 0.207 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Radium-226 | 0.351 | | 0.118 | 0.124 | 0.200 | 0.0502 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Radium-228 | 0.271 | | 0.224 | 0.226 | | 0.108 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Thallium-208 | 0.111 | | 0.0468 | 0.0482 | | 0.0176 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Thorium 228 | 0.291 | | 0.0770 | 0.0858 | | 0.0430 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Thorium-232 | 0.271 | | 0.224 | 0.226 | | 0.108 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Thorium-234 | -0.644 | U | 0.838 | 0.841 | | 0.707 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Uranium-235 | -0.199 | U | 0.339 | 0.340 | | 0.402 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |
| Uranium-238 | -0.644 | U | 0.838 | 0.841 | | 0.707 | pCi/g | 12/21/20 11:11 | 01/11/21 07:40 | 1 |

Client Sample ID: HPPG-ESU-TU099C-007

Lab Sample ID: 160-40797-7

Date Collected: 12/12/20 09:47
Date Received: 12/15/20 09:24

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.487 | | 0.145 | 0.153 | | 0.0321 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Actinium-227 | 0.165 | U | 0.283 | 0.283 | | 0.272 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Bismuth-212 | 0.000 | U | 0.478 | 0.478 | | 0.528 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Bismuth-214 | 0.404 | | 0.110 | 0.117 | | 0.0305 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Cesium-137 | 0.00244 | U | 0.0549 | 0.0549 | 0.0700 | 0.0450 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Lead-210 | 1.40 | | 1.38 | 1.39 | | 0.863 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Lead-212 | 0.268 | | 0.0733 | 0.0784 | | 0.0401 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Lead-214 | 0.344 | | 0.0960 | 0.102 | | 0.0420 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Potassium-40 | 9.46 | | 1.49 | 1.77 | | 0.235 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Protactinium-231 | 0.000 | U | 0.486 | 0.486 | | 1.83 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Protactinium-234 | 0.0549 | U | 0.125 | 0.125 | | 0.188 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Radium-226 | 0.404 | | 0.110 | 0.117 | 0.200 | 0.0305 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Radium-228 | 0.487 | | 0.145 | 0.153 | | 0.0321 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Thallium-208 | 0.111 | | 0.109 | 0.110 | | 0.0312 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Thorium 228 | 0.268 | | 0.0733 | 0.0784 | | 0.0401 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Thorium-232 | 0.487 | | 0.145 | 0.153 | | 0.0321 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Thorium-234 | 0.899 | | 0.504 | 0.514 | | 0.354 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Uranium-235 | 0.244 | U | 0.245 | 0.246 | | 0.316 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |
| Uranium-238 | 0.899 | | 0.504 | 0.514 | | 0.354 | pCi/g | 12/21/20 11:11 | 01/11/21 07:53 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-008
Date Collected: 12/12/20 09:51
Date Received: 12/15/20 09:24

Lab Sample ID: 160-40797-8
Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|---------|---------|--------|---------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.551 | | 0.223 | 0.230 | | 0.159 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Actinium-227 | -0.406 | U | 0.740 | 0.742 | | 0.426 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Bismuth-212 | 0.463 | U | 0.723 | 0.725 | | 0.544 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Bismuth-214 | 0.352 | | 0.111 | 0.117 | | 0.0423 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Cesium-137 | 0.0368 | U | 0.0690 | 0.0691 | 0.0700 | 0.0533 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Lead-210 | -0.0187 | U | | 1.63 | | 1.34 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Lead-212 | 0.287 | | 0.0925 | 0.0996 | | 0.0557 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Lead-214 | 0.426 | | 0.122 | 0.130 | | 0.0477 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Potassium-40 | 7.90 | | 1.43 | 1.64 | | 0.252 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Protactinium-231 | 0.000 | U | 0.300 | 0.300 | | 2.09 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Protactinium-234 | 0.00964 | U | 0.0163 | 0.0163 | | 0.271 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Radium-226 | 0.352 | | 0.111 | 0.117 | 0.200 | 0.0423 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Radium-228 | 0.551 | | 0.223 | 0.230 | | 0.159 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Thallium-208 | 0.165 | | 0.0484 | 0.0513 | | 0.00820 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Thorium 228 | 0.287 | | 0.0925 | 0.0996 | | 0.0557 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Thorium-232 | 0.551 | | 0.223 | 0.230 | | 0.159 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Thorium-234 | -0.821 | U | 0.877 | 0.882 | | 1.01 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Uranium-235 | -0.0254 | U | 0.0518 | 0.0518 | | 0.512 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |
| Uranium-238 | -0.821 | U | 0.877 | 0.882 | | 1.01 | pCi/g | 12/21/20 11:11 | 01/11/21 07:41 | 1 |

Client Sample ID: HPPG-ESU-TU099C-009

Date Collected: 12/12/20 09:55
Date Received: 12/15/20 09:24

Lab Sample ID: 160-40797-9

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|---------|---------|--------|---------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.271 | | 0.102 | 0.106 | | 0.0724 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Actinium-227 | -0.139 | U | 0.303 | 0.303 | | 0.253 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Bismuth-212 | 0.144 | U | 0.451 | 0.451 | | 0.357 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Bismuth-214 | 0.349 | | 0.0876 | 0.0948 | | 0.0309 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Cesium-137 | 0.000933 | U | 0.0360 | 0.0360 | 0.0700 | 0.0295 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Lead-210 | -0.369 | U | 0.961 | 0.962 | | 0.772 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Lead-212 | 0.288 | | 0.0607 | 0.0712 | | 0.0296 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Lead-214 | 0.252 | | 0.0851 | 0.0890 | | 0.0377 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Potassium-40 | 8.14 | | 1.06 | 1.35 | | 0.212 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Protactinium-231 | 0.189 | U | 0.935 | 0.935 | | 1.45 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Protactinium-234 | -0.0514 | U | 0.199 | 0.199 | | 0.163 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Radium-226 | 0.349 | | 0.0876 | 0.0948 | 0.200 | 0.0309 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Radium-228 | 0.271 | | 0.102 | 0.106 | | 0.0724 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Thallium-208 | 0.104 | | 0.0321 | 0.0339 | | 0.00809 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Thorium 228 | 0.288 | | 0.0607 | 0.0712 | | 0.0296 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Thorium-232 | 0.271 | | 0.102 | 0.106 | | 0.0724 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Thorium-234 | 0.234 | U | 0.579 | 0.580 | | 0.592 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Uranium-235 | -0.153 | U | 0.228 | 0.229 | | 0.181 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |
| Uranium-238 | 0.234 | U | 0.579 | 0.580 | | 0.592 | pCi/g | 12/21/20 11:11 | 01/11/21 07:42 | 1 |

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Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-010

Lab Sample ID: 160-40797-10

Date Collected: 12/12/20 09:59

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.236 | | 0.209 | 0.210 | | 0.109 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Actinium-227 | -0.364 | U | 0.690 | 0.691 | | 0.417 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Bismuth-212 | -0.474 | U | 0.852 | 0.854 | | 0.665 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Bismuth-214 | 0.464 | | 0.129 | 0.137 | | 0.0466 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Cesium-137 | 0.00544 | U | 0.0524 | 0.0524 | 0.0700 | 0.0426 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Lead-210 | 0.888 | U | 1.38 | 1.39 | | 0.922 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Lead-212 | 0.331 | | 0.0812 | 0.0883 | | 0.0416 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Lead-214 | 0.270 | | 0.0929 | 0.0969 | | 0.0557 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Potassium-40 | 9.37 | | 1.33 | 1.63 | | 0.109 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Protactinium-231 | 0.571 | U | 1.65 | 1.65 | | 1.81 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Protactinium-234 | -0.104 | U | 0.310 | 0.310 | | 0.253 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Radium-226 | 0.464 | | 0.129 | 0.137 | 0.200 | 0.0466 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Radium-228 | 0.236 | | 0.209 | 0.210 | | 0.109 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Thallium-208 | 0.149 | | 0.0527 | 0.0548 | | 0.0180 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Thorium 228 | 0.331 | | 0.0812 | 0.0883 | | 0.0416 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Thorium-232 | 0.236 | | 0.209 | 0.210 | | 0.109 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Thorium-234 | 0.347 | U | 0.523 | 0.525 | | 0.411 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Uranium-235 | 0.0221 | U | 0.206 | 0.206 | | 0.474 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |
| Uranium-238 | 0.347 | U | 0.523 | 0.525 | | 0.411 | pCi/g | 12/21/20 11:11 | 01/11/21 07:43 | 1 |

Client Sample ID: HPPG-ESU-TU099C-011

Lab Sample ID: 160-40797-11

Date Collected: 12/12/20 10:08

Matrix: Solid

Date Received: 12/15/20 09:24

Method: 905 - Strontium-90 (GFPC)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|----------------|---------------|------------------|---------------|---------|-------|--------|-------|-----------------|-----------------|----------------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Strontium-90 | -0.0336 | U | 0.111 | 0.111 | 0.331 | 0.0949 | pCi/g | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| Carrier | %Yield | Qualifier | Limits | | | | | Prepared | Analyzed | Dil Fac |
| Sr Carrier | 97.5 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| Y Carrier | 93.8 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.382 | | 0.116 | 0.122 | | 0.0624 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Actinium-227 | 0.0582 | U | 0.127 | 0.127 | | 0.267 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Bismuth-212 | 0.219 | U | 0.352 | 0.353 | | 0.260 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Bismuth-214 | 0.305 | | 0.0944 | 0.0996 | | 0.0390 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Cesium-137 | 0.00354 | U | 0.0362 | 0.0362 | 0.0700 | 0.0295 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Lead-210 | 0.476 | U | 1.04 | 1.04 | | 0.829 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Lead-212 | 0.295 | | 0.0594 | 0.0706 | | 0.0261 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Lead-214 | 0.340 | | 0.0680 | 0.0767 | | 0.0307 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Potassium-40 | 7.62 | | 1.01 | 1.28 | | 0.0779 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Protactinium-231 | 0.250 | U | 0.939 | 0.940 | | 1.48 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |

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Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-011

Lab Sample ID: 160-40797-11

Date Collected: 12/12/20 10:08

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|--------|-----------|---------|---------|-------|---------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Protactinium-234 | 0.0647 | U | 0.117 | 0.117 | | 0.107 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Radium-226 | 0.305 | | 0.0944 | 0.0996 | 0.200 | 0.0390 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Radium-228 | 0.382 | | 0.116 | 0.122 | | 0.0624 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Thallium-208 | 0.133 | | 0.0332 | 0.0359 | | 0.00483 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Thorium 228 | 0.295 | | 0.0594 | 0.0706 | | 0.0261 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Thorium-232 | 0.382 | | 0.116 | 0.122 | | 0.0624 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Thorium-234 | -0.289 | U | 0.864 | 0.865 | | 0.705 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Uranium-235 | 0.123 | U | 0.348 | 0.349 | | 0.283 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |
| Uranium-238 | -0.289 | U | 0.864 | 0.865 | | 0.705 | pCi/g | 12/21/20 11:11 | 01/11/21 07:44 | 1 |

Client Sample ID: HPPG-ESU-TU099C-012

Lab Sample ID: 160-40797-12

Date Collected: 12/12/20 10:15

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|--------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.410 | | 0.134 | 0.140 | | 0.0483 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Actinium-227 | 0.0961 | U | 0.234 | 0.235 | | 0.313 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Bismuth-212 | -0.212 | U | 0.765 | 0.766 | | 0.615 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Bismuth-214 | 0.342 | | 0.0937 | 0.100 | | 0.0357 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Cesium-137 | 0.0253 | U | 0.0535 | 0.0536 | 0.0700 | 0.0418 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Lead-210 | -0.505 | U | 1.31 | 1.31 | | 1.10 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Lead-212 | 0.264 | | 0.0740 | 0.0815 | | 0.0420 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Lead-214 | 0.279 | | 0.101 | 0.105 | | 0.0608 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Potassium-40 | 5.93 | | 1.04 | 1.20 | | 0.248 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Protactinium-231 | 0.000 | U | 0.523 | 0.523 | | 1.87 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Protactinium-234 | 0.105 | U | 0.198 | 0.199 | | 0.193 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Radium-226 | 0.342 | | 0.0937 | 0.100 | 0.200 | 0.0357 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Radium-228 | 0.410 | | 0.134 | 0.140 | | 0.0483 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Thallium-208 | 0.106 | | 0.0618 | 0.0628 | | 0.0311 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Thorium 228 | 0.264 | | 0.0740 | 0.0815 | | 0.0420 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Thorium-232 | 0.410 | | 0.134 | 0.140 | | 0.0483 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Thorium-234 | -0.331 | U | 0.802 | 0.803 | | 0.669 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Uranium-235 | 0.0957 | U | 0.117 | 0.118 | | 0.330 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |
| Uranium-238 | -0.331 | U | 0.802 | 0.803 | | 0.669 | pCi/g | 12/21/20 09:42 | 01/11/21 08:26 | 1 |

Client Sample ID: HPPG-ESU-TU099C-013

Lab Sample ID: 160-40797-13

Date Collected: 12/12/20 10:25

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------|--------|-----------|---------|---------|-----|-------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.368 | | 0.240 | 0.243 | | 0.106 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Actinium-227 | -0.300 | U | 0.510 | 0.510 | | 0.346 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |

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Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-013
Date Collected: 12/12/20 10:25
Date Received: 12/15/20 09:24

Lab Sample ID: 160-40797-13
Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|--------------------|--------------------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Bismuth-212 | -0.397 | U | 0.865 | 0.866 | | 0.677 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Bismuth-214 | 0.329 | | 0.128 | 0.132 | | 0.0528 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Cesium-137 | -0.0270 | U | 0.0779 | 0.0779 | 0.0700 | 0.0620 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Lead-210 | 1.11 | | 1.17 | 1.18 | | 0.785 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Lead-212 | 0.318 | | 0.0770 | 0.0839 | | 0.0384 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Lead-214 | 0.329 | | 0.0954 | 0.101 | | 0.0463 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Potassium-40 | 7.84 | | 1.41 | 1.61 | | 0.248 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Protactinium-231 | -0.851 | U | 2.87 | 2.87 | | 2.34 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Protactinium-234 | 0.0749 | U | 0.106 | 0.106 | | 0.207 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Radium-226 | 0.329 | | 0.128 | 0.132 | 0.200 | 0.0528 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Radium-228 | 0.368 | | 0.240 | 0.243 | | 0.106 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Thallium-208 | 0.122 | | 0.0674 | 0.0685 | | 0.0286 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Thorium 228 | 0.318 | | 0.0770 | 0.0839 | | 0.0384 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Thorium-232 | 0.368 | | 0.240 | 0.243 | | 0.106 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Thorium-234 | 0.304 | U | 0.454 | 0.455 | | 0.354 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Uranium-235 | 0.0938 | U | 0.401 | 0.401 | | 0.327 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |
| Uranium-238 | 0.304 | U | 0.454 | 0.455 | | 0.354 | pCi/g | 12/21/20 09:42 | 01/11/21 08:29 | 1 |

Client Sample ID: HPPG-ESU-TU099C-014

Lab Sample ID: 160-40797-14

Date Collected: 12/12/20 10:34
Date Received: 12/15/20 09:24

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|--------------------|--------------------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Actinium 228 | 0.321 | | 0.196 | 0.199 | | 0.106 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Actinium-227 | -0.0204 | U | 0.507 | 0.507 | | 0.301 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Bismuth-212 | -0.0000000 | U | 0.770 | 0.770 | | 0.634 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| | | | 0.779 | | | | | | | |
| Bismuth-214 | 0.349 | | 0.105 | 0.111 | | 0.0390 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Cesium-137 | -0.0268 | U | 0.0648 | 0.0649 | 0.0700 | 0.0509 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Lead-210 | -0.130 | U | 1.56 | 1.56 | | 1.29 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Lead-212 | 0.239 | | 0.0814 | 0.0871 | | 0.0491 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Lead-214 | 0.422 | | 0.115 | 0.123 | | 0.0440 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Potassium-40 | 6.60 | | 1.25 | 1.42 | | 0.232 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Protactinium-231 | -0.601 | U | 2.54 | 2.54 | | 2.07 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Protactinium-234 | 0.0996 | U | 0.194 | 0.194 | | 0.205 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Radium-226 | 0.349 | | 0.105 | 0.111 | 0.200 | 0.0390 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Radium-228 | 0.321 | | 0.196 | 0.199 | | 0.106 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thallium-208 | 0.0773 | | 0.0399 | 0.0407 | | 0.0462 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thorium 228 | 0.239 | | 0.0814 | 0.0871 | | 0.0491 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thorium-232 | 0.321 | | 0.196 | 0.199 | | 0.106 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thorium-234 | -0.387 | U | 0.780 | 0.782 | | 0.934 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Uranium-235 | 0.121 | U | 0.236 | 0.236 | | 0.355 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Uranium-238 | -0.387 | U | 0.780 | 0.782 | | 0.934 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

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 Client: Aptim Federal Services LLC
 Project/Site: HPNS-Parcel G 501197

 Job ID: 160-40797-1
 SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-015
Lab Sample ID: 160-40797-15

Matrix: Solid

 Date Collected: 12/12/20 10:44
 Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.290 | | 0.108 | 0.112 | | 0.0626 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Actinium-227 | 0.138 | U | 0.315 | 0.315 | | 0.214 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Bismuth-212 | -0.175 | U | 0.580 | 0.581 | | 0.464 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Bismuth-214 | 0.370 | | 0.0944 | 0.102 | | 0.0320 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Cesium-137 | 0.00100 | U | 0.0368 | 0.0368 | 0.0700 | 0.0302 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Lead-210 | 0.537 | U | 0.929 | 0.931 | | 0.733 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Lead-212 | 0.333 | | 0.0634 | 0.0766 | | 0.0265 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Lead-214 | 0.297 | | 0.0841 | 0.0895 | | 0.0416 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Potassium-40 | 6.60 | | 0.998 | 1.21 | | 0.227 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Protactinium-231 | -0.658 | U | 2.06 | 2.06 | | 1.68 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Protactinium-234 | 0.0315 | U | 0.0544 | 0.0545 | | 0.176 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Radium-226 | 0.370 | | 0.0944 | 0.102 | 0.200 | 0.0320 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Radium-228 | 0.290 | | 0.108 | 0.112 | | 0.0626 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thallium-208 | 0.0989 | | 0.0343 | 0.0358 | | 0.0112 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thorium 228 | 0.333 | | 0.0634 | 0.0766 | | 0.0265 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thorium-232 | 0.290 | | 0.108 | 0.112 | | 0.0626 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Thorium-234 | 0.000 | U | 0.374 | 0.374 | | 0.670 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Uranium-235 | 0.114 | U | 0.227 | 0.227 | | 0.182 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |
| Uranium-238 | 0.000 | U | 0.374 | 0.374 | | 0.670 | pCi/g | 12/21/20 09:42 | 01/11/21 08:24 | 1 |

Client Sample ID: HPPG-ESU-TU099C-016
Lab Sample ID: 160-40797-16

 Date Collected: 12/12/20 10:53
 Date Received: 12/15/20 09:24

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|---------------------|--------------|-----------|---------|---------|--------|---------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.333 | | 0.113 | 0.118 | | 0.0786 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Actinium-227 | 0.147 | U | 0.287 | 0.287 | | 0.163 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Bismuth-212 | 0.291 | U | 0.474 | 0.475 | | 0.365 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Bismuth-214 | 0.222 | | 0.0784 | 0.0817 | | 0.0331 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Cesium-137 | 0.00449 | U | 0.0359 | 0.0359 | 0.0700 | 0.0292 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Lead-210 | 0.0282 | U | 0.946 | 0.946 | | 0.778 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Lead-212 | 0.246 | | 0.0542 | 0.0629 | | 0.0269 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Lead-214 | 0.253 | | 0.0629 | 0.0682 | | 0.0289 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Potassium-40 | 7.59 | | 0.951 | 1.23 | | 0.0694 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Protactinium-231 | -0.607 | U | 1.83 | 1.83 | | 1.49 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Protactinium-234 | 0.0507 | U | 0.0864 | 0.0866 | | 0.152 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Radium-226 | 0.222 | | 0.0784 | 0.0817 | 0.200 | 0.0331 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Radium-228 | 0.333 | | 0.113 | 0.118 | | 0.0786 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Thallium-208 | 0.100 | | 0.0312 | 0.0329 | | 0.00823 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Thorium 228 | 0.246 | | 0.0542 | 0.0629 | | 0.0269 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Thorium-232 | 0.333 | | 0.113 | 0.118 | | 0.0786 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Thorium-234 | -0.0242 | U | 0.0499 | 0.0499 | | 0.717 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Uranium-235 | 0.0941 | U | 0.262 | 0.262 | | 0.238 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |
| Uranium-238 | -0.0242 | U | 0.0499 | 0.0499 | | 0.717 | pCi/g | 12/21/20 09:42 | 01/11/21 08:27 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-017

Lab Sample ID: 160-40797-17

Matrix: Solid

Date Collected: 12/12/20 11:03
Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.252 | | 0.222 | 0.224 | | 0.121 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Actinium-227 | -0.292 | U | 0.557 | 0.558 | | 0.335 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Bismuth-212 | 0.289 | U | 0.605 | 0.606 | | 0.468 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Bismuth-214 | 0.338 | | 0.115 | 0.120 | | 0.0500 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Cesium-137 | 0.000 | U | 0.0126 | 0.0126 | 0.0700 | 0.0198 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Lead-210 | 0.378 | U | | 1.14 | | 0.822 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Lead-212 | 0.285 | | 0.0781 | 0.0835 | | 0.0431 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Lead-214 | 0.399 | | 0.104 | 0.111 | | 0.0390 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Potassium-40 | 7.89 | | 1.19 | 1.44 | | 0.105 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Protactinium-231 | -0.860 | U | 2.96 | 2.97 | | 2.42 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Protactinium-234 | 0.0336 | U | 0.0598 | 0.0599 | | 0.217 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Radium-226 | 0.338 | | 0.115 | 0.120 | 0.200 | 0.0500 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Radium-228 | 0.252 | | 0.222 | 0.224 | | 0.121 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Thallium-208 | 0.128 | | 0.0494 | 0.0511 | | 0.0174 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Thorium 228 | 0.285 | | 0.0781 | 0.0835 | | 0.0431 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Thorium-232 | 0.252 | | 0.222 | 0.224 | | 0.121 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Thorium-234 | 0.987 | | 0.468 | 0.481 | | 0.322 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Uranium-235 | 0.155 | U | 0.310 | 0.310 | | 0.331 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |
| Uranium-238 | 0.987 | | 0.468 | 0.481 | | 0.322 | pCi/g | 12/21/20 09:42 | 01/11/21 09:02 | 1 |

Client Sample ID: HPPG-ESU-TU099C-018

Lab Sample ID: 160-40797-18

Matrix: Solid

Date Collected: 12/12/20 11:12
Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.262 | | 0.123 | 0.126 | | 0.153 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Actinium-227 | 0.186 | U | 0.414 | 0.414 | | 0.347 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Bismuth-212 | -0.311 | U | 0.971 | 0.972 | | 0.775 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Bismuth-214 | 0.478 | | 0.143 | 0.153 | | 0.0580 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Cesium-137 | 0.0241 | U | 0.0834 | 0.0834 | 0.0700 | 0.0668 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Lead-210 | -2.44 | U | 1.45 | 1.49 | | 1.86 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Lead-212 | 0.0248 | U | 0.128 | 0.128 | | 0.104 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Lead-214 | 0.442 | | 0.126 | 0.136 | | 0.0513 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Potassium-40 | 7.80 | | 1.38 | 1.65 | | 0.322 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Protactinium-231 | -0.817 | U | 3.07 | 3.07 | | 2.50 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Protactinium-234 | 0.215 | U | 0.232 | 0.233 | | 0.255 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Radium-226 | 0.478 | | 0.143 | 0.153 | 0.200 | 0.0580 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Radium-228 | 0.262 | | 0.123 | 0.126 | | 0.153 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Thallium-208 | 0.209 | | 0.0737 | 0.0775 | | 0.0247 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Thorium 228 | 0.0248 | U | 0.128 | 0.128 | | 0.104 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Thorium-232 | 0.262 | | 0.123 | 0.126 | | 0.153 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Thorium-234 | 0.121 | U | 0.539 | 0.539 | | 0.432 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Uranium-235 | 0.267 | U | 0.230 | 0.232 | | 0.411 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |
| Uranium-238 | 0.121 | U | 0.539 | 0.539 | | 0.432 | pCi/g | 12/21/20 09:42 | 01/11/21 08:25 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-019

Lab Sample ID: 160-40797-19

Date Collected: 12/12/20 11:21

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.236 | | 0.124 | 0.126 | | 0.113 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Actinium-227 | -0.180 U | | 0.303 | 0.304 | | 0.372 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Bismuth-212 | -0.249 U | | 0.785 | 0.786 | | 0.628 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Bismuth-214 | 0.336 | | 0.113 | 0.119 | | 0.0470 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Cesium-137 | -0.00349 U | | 0.0404 | 0.0404 | 0.0700 | 0.0465 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Lead-210 | 0.556 U | | 1.49 | 1.49 | | 0.931 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Lead-212 | 0.307 | | 0.0789 | 0.0883 | | 0.0426 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Lead-214 | 0.314 | | 0.105 | 0.110 | | 0.0510 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Potassium-40 | 7.76 | | 1.21 | 1.45 | | 0.264 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Protactinium-231 | 0.313 U | | 1.24 | 1.24 | | 1.97 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Protactinium-234 | -0.0853 U | | 0.277 | 0.277 | | 0.225 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Radium-226 | 0.336 | | 0.113 | 0.119 | 0.200 | 0.0470 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Radium-228 | 0.236 | | 0.124 | 0.126 | | 0.113 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Thallium-208 | 0.110 | | 0.0484 | 0.0497 | | 0.0225 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Thorium 228 | 0.307 | | 0.0789 | 0.0883 | | 0.0426 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Thorium-232 | 0.236 | | 0.124 | 0.126 | | 0.113 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Thorium-234 | -1.01 U | | 0.571 | 0.582 | | 0.770 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Uranium-235 | -0.137 U | | 0.306 | 0.306 | | 0.442 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |
| Uranium-238 | -1.01 U | | 0.571 | 0.582 | | 0.770 | pCi/g | 12/21/20 09:42 | 01/11/21 08:58 | 1 |

Client Sample ID: HPPG-ESU-TU099C-020

Lab Sample ID: 160-40797-20

Date Collected: 12/12/20 11:32

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.235 | | 0.168 | 0.170 | | 0.0358 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Actinium-227 | 0.161 U | | 0.431 | 0.432 | | 0.290 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Bismuth-212 | 0.342 U | | 0.621 | 0.622 | | 0.465 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Bismuth-214 | 0.373 | | 0.118 | 0.124 | | 0.0443 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Cesium-137 | 0.00994 U | | 0.0644 | 0.0644 | 0.0700 | 0.0520 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Lead-210 | 1.02 | | 1.51 | 1.51 | | 0.978 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Lead-212 | 0.299 | | 0.0729 | 0.0793 | | 0.0328 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Lead-214 | 0.429 | | 0.0982 | 0.107 | | 0.0459 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Potassium-40 | 7.77 | | 1.44 | 1.64 | | 0.262 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Protactinium-231 | 0.000 U | | 0.712 | 0.712 | | 2.03 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Protactinium-234 | 0.0671 U | | 0.219 | 0.219 | | 0.178 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Radium-226 | 0.373 | | 0.118 | 0.124 | 0.200 | 0.0443 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Radium-228 | 0.235 | | 0.168 | 0.170 | | 0.0358 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Thallium-208 | 0.114 | | 0.0717 | 0.0726 | | 0.0302 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Thorium 228 | 0.299 | | 0.0729 | 0.0793 | | 0.0328 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Thorium-232 | 0.235 | | 0.168 | 0.170 | | 0.0358 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Thorium-234 | 0.312 U | | 0.362 | 0.364 | | 0.384 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Uranium-235 | 0.00410 U | | 0.0104 | 0.0104 | | 0.404 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |
| Uranium-238 | 0.312 U | | 0.362 | 0.364 | | 0.384 | pCi/g | 12/21/20 09:42 | 01/11/21 09:14 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-021

Lab Sample ID: 160-40797-21

Date Collected: 12/12/20 11:39

Matrix: Solid

Date Received: 12/15/20 09:24

Method: 905 - Strontium-90 (GFPC)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|----------------|--------|-----------|--------------------|--------------------|-------|--------|-------|-----------------|-----------------|----------------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Strontium-90 | 0.153 | | 0.134 | 0.134 | 0.331 | 0.0954 | pCi/g | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| <i>Carrier</i> | %Yield | Qualifier | <i>Limits</i> | | | | | <i>Prepared</i> | <i>Analyzed</i> | <i>Dil Fac</i> |
| Sr Carrier | 97.1 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| Y Carrier | 90.8 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|---------|-----------|--------------------|--------------------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Actinium 228 | 0.121 | U | 0.272 | 0.273 | | 0.139 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Actinium-227 | 0.245 | U | 0.515 | 0.516 | | 0.294 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Bismuth-212 | 0.000 | U | 0.233 | 0.233 | | 0.721 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Bismuth-214 | 0.118 | U | 0.102 | 0.103 | | 0.153 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Cesium-137 | 0.00130 | U | 0.0452 | 0.0452 | 0.0700 | 0.0370 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Lead-210 | 1.40 | | 1.34 | 1.35 | | 1.02 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Lead-212 | 0.293 | | 0.0936 | 0.101 | | 0.0563 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Lead-214 | 0.334 | | 0.106 | 0.112 | | 0.0675 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Potassium-40 | 7.39 | | 1.39 | 1.58 | | 0.253 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Protactinium-231 | 0.688 | U | 2.05 | 2.05 | | 1.65 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Protactinium-234 | -0.106 | U | 0.298 | 0.298 | | 0.242 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Radium-226 | 0.118 | U | 0.102 | 0.103 | 0.200 | 0.153 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Radium-228 | 0.121 | U | 0.272 | 0.273 | | 0.139 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Thallium-208 | 0.112 | | 0.0608 | 0.0619 | | 0.0253 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Thorium 228 | 0.293 | | 0.0936 | 0.101 | | 0.0563 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Thorium-232 | 0.121 | U | 0.272 | 0.273 | | 0.139 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Thorium-234 | -0.334 | U | 1.34 | 1.34 | | 1.11 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Uranium-235 | 0.287 | U | 0.251 | 0.252 | | 0.380 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |
| Uranium-238 | -0.334 | U | 1.34 | 1.34 | | 1.11 | pCi/g | 12/21/20 09:42 | 01/11/21 09:00 | 1 |

Client Sample ID: HPPG-ESU-TU099C-022

Lab Sample ID: 160-40797-22

Date Collected: 12/12/20 11:50

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|--------------------|--------------------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Actinium 228 | 0.232 | | 0.107 | 0.110 | | 0.0441 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Actinium-227 | 0.182 | U | 0.367 | 0.368 | | 0.210 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Bismuth-212 | -0.229 | U | 0.553 | 0.554 | | 0.435 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Bismuth-214 | 0.292 | | 0.0893 | 0.0943 | | 0.0332 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Cesium-137 | 0.0219 | U | 0.0406 | 0.0406 | 0.0700 | 0.0312 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Lead-210 | -0.601 | U | 1.33 | 1.33 | | 1.07 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Lead-212 | 0.236 | | 0.0610 | 0.0682 | | 0.0325 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Lead-214 | 0.297 | | 0.0806 | 0.0863 | | 0.0315 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Potassium-40 | 7.23 | | 1.06 | 1.29 | | 0.234 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Protactinium-231 | 0.000 | U | 0.345 | 0.345 | | 1.53 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |

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Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-022
Date Collected: 12/12/20 11:50
Date Received: 12/15/20 09:24

Lab Sample ID: 160-40797-22
Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|----------|-----------|---------|---------|-------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Protactinium-234 | -0.0728 | U | 0.208 | 0.208 | | 0.169 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Radium-226 | 0.292 | | 0.0893 | 0.0943 | 0.200 | 0.0332 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Radium-228 | 0.232 | | 0.107 | 0.110 | | 0.0441 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Thallium-208 | 0.0734 | | 0.0542 | 0.0547 | | 0.0249 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Thorium 228 | 0.236 | | 0.0610 | 0.0682 | | 0.0325 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Thorium-232 | 0.232 | | 0.107 | 0.110 | | 0.0441 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Thorium-234 | -0.00227 | U | 0.00466 | 0.00467 | | 0.778 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Uranium-235 | -0.125 | U | 0.364 | 0.364 | | 0.296 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |
| Uranium-238 | -0.00227 | U | 0.00466 | 0.00467 | | 0.778 | pCi/g | 12/21/20 09:42 | 01/11/21 09:01 | 1 |

Client Sample ID: HPPG-ESU-TU099C-023

Lab Sample ID: 160-40797-23

Date Collected: 12/12/20 12:01

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|---------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.313 | | 0.109 | 0.114 | | 0.0696 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Actinium-227 | 0.0427 | U | 0.140 | 0.140 | | 0.239 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Bismuth-212 | 0.137 | U | 0.494 | 0.494 | | 0.393 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Bismuth-214 | 0.328 | | 0.0886 | 0.0949 | | 0.0325 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Cesium-137 | -0.0307 | U | 0.0528 | 0.0529 | 0.0700 | 0.0410 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Lead-210 | -0.595 | U | 1.13 | 1.13 | | 0.898 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Lead-212 | 0.310 | | 0.0610 | 0.0730 | | 0.0227 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Lead-214 | 0.370 | | 0.0852 | 0.0935 | | 0.0339 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Potassium-40 | 8.80 | | 1.15 | 1.46 | | 0.0869 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Protactinium-231 | 0.485 | U | 1.38 | 1.38 | | 1.51 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Protactinium-234 | 0.0662 | U | 0.208 | 0.208 | | 0.169 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Radium-226 | 0.328 | | 0.0886 | 0.0949 | 0.200 | 0.0325 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Radium-228 | 0.313 | | 0.109 | 0.114 | | 0.0696 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Thallium-208 | 0.0778 | | 0.0402 | 0.0410 | | 0.0164 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Thorium 228 | 0.310 | | 0.0610 | 0.0730 | | 0.0227 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Thorium-232 | 0.313 | | 0.109 | 0.114 | | 0.0696 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Thorium-234 | 0.179 | U | 0.419 | 0.419 | | 0.695 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Uranium-235 | 0.104 | U | 0.178 | 0.179 | | 0.294 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |
| Uranium-238 | 0.179 | U | 0.419 | 0.419 | | 0.695 | pCi/g | 12/21/20 09:42 | 01/11/21 09:03 | 1 |

Client Sample ID: HPPG-ESU-TU099C-024

Lab Sample ID: 160-40797-24

Date Collected: 12/12/20 12:12

Matrix: Solid

Date Received: 12/15/20 09:24

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------|--------|-----------|---------|---------|-----|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.371 | | 0.135 | 0.141 | | 0.0288 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Actinium-227 | 0.233 | U | 0.390 | 0.391 | | 0.235 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-ESU-TU099C-024

Lab Sample ID: 160-40797-24

Date Collected: 12/12/20 12:12
Date Received: 12/15/20 09:24

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac | |
|-------------------|--------------|-----------|---------|---------|--------|--------|--------|----------------|----------------|----------------|---|
| | | | (2σ+/-) | (2σ+/-) | | | | | | | |
| Bismuth-212 | 0.531 | U | | 1.07 | 1.08 | 0.851 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 | |
| Bismuth-214 | 0.0689 | U | | 0.256 | 0.256 | 0.177 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 | |
| Cesium-137 | -0.00771 | U | | 0.0521 | 0.0521 | 0.0700 | 0.0421 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Lead-210 | 0.892 | | | 1.21 | 1.21 | | 0.835 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Lead-212 | 0.280 | | | 0.0796 | 0.0848 | | 0.0437 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Lead-214 | 0.382 | | | 0.117 | 0.123 | | 0.0533 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Potassium-40 | 8.05 | | | 1.24 | 1.49 | | 0.112 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Protactinium-231 | 0.0000000 | U | | 2.54 | 2.54 | | 2.10 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| | 261 | | | | | | | | | | |
| Protactinium-234 | 0.0815 | U | | 0.188 | 0.188 | | 0.199 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Radium-226 | 0.0689 | U | | 0.256 | 0.256 | 0.200 | 0.177 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Radium-228 | 0.371 | | | 0.135 | 0.141 | | 0.0288 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Thallium-208 | 0.118 | | | 0.0696 | 0.0706 | | 0.0333 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Thorium-228 | 0.280 | | | 0.0796 | 0.0848 | | 0.0437 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Thorium-232 | 0.371 | | | 0.135 | 0.141 | | 0.0288 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Thorium-234 | 0.879 | | | 0.421 | 0.432 | | 0.278 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Uranium-235 | 0.000 | U | | 0.199 | 0.199 | | 0.360 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |
| Uranium-238 | 0.879 | | | 0.421 | 0.432 | | 0.278 | pCi/g | 12/21/20 09:42 | 01/11/21 09:39 | 1 |

Client Sample ID: HPPG-ESU-TU099C-025

Lab Sample ID: 160-40797-25

Date Collected: 12/12/20 12:35
Date Received: 12/15/20 09:24

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac | |
|--------------------|--------------|-----------|---------|---------|--------|--------|--------|----------|----------------|----------------|---|
| | | | (2σ+/-) | (2σ+/-) | | | | | | | |
| Actinium 228 | 0.463 | | | 0.150 | 0.159 | | 0.0339 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Actinium-227 | 0.112 | U | | 0.364 | 0.365 | | 0.337 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Bismuth-212 | -0.0474 | U | | 1.12 | 1.12 | | 0.916 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Bismuth-214 | 0.0424 | U | | 0.240 | 0.240 | | 0.196 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Cesium-137 | -0.0143 | U | | 0.0822 | 0.0822 | 0.0700 | 0.0666 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Lead-210 | 0.973 | | | 1.46 | 1.47 | | 0.939 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Lead-212 | 0.0194 | U | | 0.119 | 0.119 | | 0.0966 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Lead-214 | 0.307 | | | 0.122 | 0.127 | | 0.0528 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Potassium-40 | 7.45 | | | 1.36 | 1.61 | | 0.327 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Protactinium-231 | 0.000 | U | | 0.563 | 0.563 | | 2.20 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Protactinium-234 | 0.191 | U | | 0.259 | 0.260 | | 0.234 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Radium-226 | 0.0424 | U | | 0.240 | 0.240 | 0.200 | 0.196 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Radium-228 | 0.463 | | | 0.150 | 0.159 | | 0.0339 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Thallium-208 | 0.166 | | | 0.0537 | 0.0570 | | 0.0136 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Thorium 228 | 0.0194 | U | | 0.119 | 0.119 | | 0.0966 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Thorium-232 | 0.463 | | | 0.150 | 0.159 | | 0.0339 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Thorium-234 | -0.875 | U | | 0.590 | 0.599 | | 0.613 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Uranium-235 | 0.000 | U | | 0.229 | 0.229 | | 0.417 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |
| Uranium-238 | -0.875 | U | | 0.590 | 0.599 | | 0.613 | pCi/g | 12/21/20 09:42 | 01/11/21 08:59 | 1 |

Eurofins TestAmerica, St. Louis

Client Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Client Sample ID: HPPG-F-059

Date Collected: 12/12/20 12:35
Date Received: 12/15/20 09:24

Lab Sample ID: 160-40797-26

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|-------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.241 | | 0.221 | 0.222 | | 0.116 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Actinium-227 | -0.159 U | | 0.538 | 0.538 | | 0.328 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Bismuth-212 | -0.0158 U | | 1.18 | 1.18 | | 0.526 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Bismuth-214 | 0.0298 U | | 0.125 | 0.125 | | 0.126 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Cesium-137 | -0.0356 U | | 0.0612 | 0.0613 | 0.0700 | 0.0474 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Lead-210 | 0.693 U | | 1.14 | 1.14 | | 0.765 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Lead-212 | 0.334 | | 0.0730 | 0.0848 | | 0.0316 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Lead-214 | 0.236 | | 0.0875 | 0.0909 | | 0.0871 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Potassium-40 | 6.59 | | 1.11 | 1.30 | | 0.253 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Protactinium-231 | 0.000 U | | 0.425 | 0.425 | | 1.64 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Protactinium-234 | 0.163 | | 0.123 | 0.124 | | 0.142 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Radium-226 | 0.0298 U | | 0.125 | 0.125 | 0.200 | 0.126 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Radium-228 | 0.241 | | 0.221 | 0.222 | | 0.116 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Thallium-208 | 0.154 | | 0.0696 | 0.0714 | | 0.0278 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Thorium 228 | 0.334 | | 0.0730 | 0.0848 | | 0.0316 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Thorium-232 | 0.241 | | 0.221 | 0.222 | | 0.116 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Thorium-234 | 0.353 | | 0.342 | 0.344 | | 0.265 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Uranium-235 | 0.000 U | | 0.115 | 0.115 | | 0.246 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |
| Uranium-238 | 0.353 | | 0.342 | 0.344 | | 0.265 | pCi/g | 12/21/20 09:42 | 01/11/21 08:34 | 1 |

Client Sample ID: HPPG-F-060

Date Collected: 12/12/20 09:55
Date Received: 12/15/20 09:24

Lab Sample ID: 160-40797-27

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|---------|---------|--------|--------|-------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | |
| Actinium 228 | 0.352 | | 0.158 | 0.162 | | 0.0587 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Actinium-227 | -0.363 U | | 0.640 | 0.642 | | 0.342 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Bismuth-212 | -0.297 U | | 0.893 | 0.894 | | 0.536 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Bismuth-214 | 0.205 | | 0.0679 | 0.0712 | | 0.0215 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Cesium-137 | -0.0388 U | | 0.0574 | 0.0576 | 0.0700 | 0.0442 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Lead-210 | 0.176 U | | 0.910 | 0.910 | | 0.733 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Lead-212 | 0.242 | | 0.0734 | 0.0798 | | 0.0466 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Lead-214 | 0.392 | | 0.0945 | 0.103 | | 0.0287 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Potassium-40 | 7.25 | | 1.15 | 1.37 | | 0.170 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Protactinium-231 | 0.000 U | | 0.257 | 0.257 | | 1.70 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Protactinium-234 | -0.0936 U | | 0.202 | 0.202 | | 0.163 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Radium-226 | 0.205 | | 0.0679 | 0.0712 | 0.200 | 0.0215 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Radium-228 | 0.352 | | 0.158 | 0.162 | | 0.0587 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Thallium-208 | 0.0818 | | 0.0389 | 0.0398 | | 0.0172 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Thorium 228 | 0.242 | | 0.0734 | 0.0798 | | 0.0466 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Thorium-232 | 0.352 | | 0.158 | 0.162 | | 0.0587 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Thorium-234 | -0.742 U | | 0.488 | 0.495 | | 0.960 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Uranium-235 | 0.136 U | | 0.310 | 0.310 | | 0.251 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |
| Uranium-238 | -0.742 U | | 0.488 | 0.495 | | 0.960 | pCi/g | 12/21/20 09:42 | 01/11/21 08:32 | 1 |

Eurofins TestAmerica, St. Louis

QC Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Method: 905 - Strontium-90 (GFPC)

Lab Sample ID: MB 160-493207/23-A

Matrix: Solid

Analysis Batch: 494113

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 493207

| Analyte | MB | MB | Count Uncert. (2σ+/-) | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|----------------|---------|-----------|-----------------------------|-----------------------------|-------|-------|-------|----------------|----------------|---------|
| | Result | Qualifier | | | | | | | | |
| Strontium-90 | 0.04436 | U | 0.145 | 0.145 | 0.331 | 0.116 | pCi/g | 12/28/20 18:50 | 01/06/21 17:55 | 1 |
| Carrier | | | | | | | | | | |
| Sr Carrier | | | | | | | | | | |
| Y Carrier | | | | | | | | | | |

Lab Sample ID: LCS 160-493207/1-A

Matrix: Solid

Analysis Batch: 494112

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 493207

| Analyte | MB | MB | Spike Added | LCS Result | LCS Qual | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | %Rec. | Limits |
|----------------|--------|-----------|----------------|---------------|-------------|-----------------------------|-------|-------|-------|-------|----------|
| | Result | Qualifier | | | | | | | | | |
| Strontium-90 | 7.75 | | 7.75 | 6.324 | | 0.698 | 0.331 | 0.131 | pCi/g | 82 | 75 - 125 |
| Carrier | | | | | | | | | | | |
| Sr Carrier | | | | | | | | | | | |
| Y Carrier | | | | | | | | | | | |

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-492605/1-A

Matrix: Solid

Analysis Batch: 494542

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 492605

| Analyte | MB | MB | Count Uncert. (2σ+/-) | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|-----------|-----------|-----------------------------|-----------------------------|--------|--------|-------|----------------|----------------|---------|
| | Result | Qualifier | | | | | | | | |
| Actinium 228 | 0.06113 | U | 0.106 | 0.107 | | 0.136 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Actinium-227 | 0.01652 | U | 0.0347 | 0.0348 | | 0.314 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Bismuth-212 | -0.3625 | U | 0.896 | 0.897 | | 0.636 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Bismuth-214 | -0.004102 | U | 0.160 | 0.160 | | 0.131 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Cesium-137 | 0.0000 | U | 0.0197 | 0.0197 | 0.0700 | 0.0375 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Lead-210 | 0.1712 | U | 1.37 | 1.37 | | 0.946 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Lead-212 | -0.009176 | U | 0.0962 | 0.0962 | | 0.0793 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Lead-214 | -0.02108 | U | 0.0822 | 0.0822 | | 0.0946 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Potassium-40 | -0.3081 | U | 0.768 | 0.769 | | 0.479 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Protactinium-231 | 0.3053 | U | 1.18 | 1.18 | | 1.85 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Protactinium-234 | 0.03932 | U | 0.0321 | 0.0324 | | 0.160 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Radium-226 | -0.004102 | U | 0.160 | 0.160 | 0.200 | 0.131 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Radium-228 | 0.06113 | U | 0.106 | 0.107 | | 0.136 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Thallium-208 | -0.04000 | U | 0.0298 | 0.0301 | | 0.0438 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Thorium 228 | -0.009176 | U | 0.0962 | 0.0962 | | 0.0793 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Thorium-232 | 0.06113 | U | 0.106 | 0.107 | | 0.136 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Thorium-234 | -0.5956 | U | 0.741 | 0.744 | | 0.745 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Uranium-235 | 0.0000 | U | 0.112 | 0.112 | | 0.231 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |
| Uranium-238 | -0.5956 | U | 0.741 | 0.744 | | 0.745 | pCi/g | 12/21/20 09:42 | 01/11/21 07:59 | 1 |

Eurofins TestAmerica, St. Louis

QC Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-492605/2-A

Client Sample ID: Lab Control Sample

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 494544

Prep Batch: 492605

| Analyte | Spike Added | LCS | | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | %Rec | %Rec. Limits |
|---------------|-------------|--------|------|--------------------------|--------|--------|-------|------|-----------------|
| | | Result | Qual | | | | | | |
| Americium-241 | 96.4 | 91.25 | | 9.63 | | 0.619 | pCi/g | 95 | 87 - 116 |
| Cesium-137 | 26.7 | 24.98 | | 2.68 | 0.0700 | 0.107 | pCi/g | 94 | 87 - 120 |
| Cobalt-60 | 9.37 | 8.648 | | 0.927 | | 0.0364 | pCi/g | 92 | 87 - 115 |

Lab Sample ID: MB 160-492625/1-A

Client Sample ID: Method Blank

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 494547

Prep Batch: 492625

| Analyte | MB Result | MB Qualifier | Count | | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|-----------|--------------|---------|---------|--------------------------|--------|--------|----------------|----------------|----------------|---------|
| | | | (2σ+/-) | (2σ+/-) | | | | | | | |
| Actinium 228 | 0.04214 | U | 0.164 | 0.164 | | | 0.115 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Actinium-227 | -0.3299 | U | 0.694 | 0.695 | | | 0.395 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Bismuth-212 | -0.02134 | U | 0.859 | 0.859 | | | 0.705 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Bismuth-214 | 0.04187 | U | 0.0575 | 0.0576 | | | 0.151 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Cesium-137 | 0.003494 | U | 0.0428 | 0.0428 | 0.0700 | 0.0345 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 | |
| Lead-210 | -0.7074 | U | 1.37 | 1.37 | | | 1.17 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Lead-212 | -0.01201 | U | 0.0608 | 0.0608 | | | 0.0505 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Lead-214 | -0.09938 | U | 0.133 | 0.133 | | | 0.111 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Potassium-40 | -0.3130 | U | 1.10 | 1.10 | | | 0.572 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Protactinium-231 | 0.4064 | U | 1.30 | 1.30 | | | 1.44 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Protactinium-234 | 0.08226 | U | 0.221 | 0.221 | | | 0.177 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Radium-226 | 0.04187 | U | 0.0575 | 0.0576 | 0.200 | 0.151 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 | |
| Radium-228 | 0.04214 | U | 0.164 | 0.164 | | | 0.115 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thallium-208 | 0.03952 | U | 0.0299 | 0.0302 | | | 0.0416 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thorium 228 | -0.01201 | U | 0.0608 | 0.0608 | | | 0.0505 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thorium-232 | 0.04214 | U | 0.164 | 0.164 | | | 0.115 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thorium-234 | -0.5682 | U | 0.672 | 0.675 | | | 1.07 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Uranium-235 | 0.0000 | U | 0.0633 | 0.0633 | | | 0.330 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Uranium-238 | -0.5682 | U | 0.672 | 0.675 | | | 1.07 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |

Lab Sample ID: LCS 160-492625/2-A

Client Sample ID: Lab Control Sample

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 494546

Prep Batch: 492625

| Analyte | Spike Added | LCS | | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | %Rec | %Rec. Limits |
|---------------|-------------|--------|------|--------------------------|--------|--------|-------|------|-----------------|
| | | Result | Qual | | | | | | |
| Americium-241 | 96.4 | 98.26 | | 11.6 | | 0.586 | pCi/g | 102 | 87 - 116 |
| Cesium-137 | 26.7 | 29.70 | | 3.12 | 0.0700 | 0.129 | pCi/g | 111 | 87 - 120 |
| Cobalt-60 | 9.37 | 9.998 | | 1.05 | | 0.0323 | pCi/g | 107 | 87 - 115 |

Lab Sample ID: 160-40797-11 DU

Client Sample ID: HPPG-ESU-TU099C-011

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 494546

Prep Batch: 492625

| Analyte | Sample | | DU | | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | RER | RER Limit |
|--------------|--------|------|---------|------|--------------------------|-----|--------|-------|-----|-----------|
| | Result | Qual | Result | Qual | | | | | | |
| Actinium 228 | 0.382 | | 0.3726 | | 0.146 | | 0.0288 | pCi/g | | 0.03 |
| Actinium-227 | 0.0582 | U | -0.3728 | U | 0.708 | | 0.427 | pCi/g | | 0.52 |

Eurofins TestAmerica, St. Louis

QC Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 160-40797-11 DU
Matrix: Solid
Analysis Batch: 494546

Client Sample ID: HPPG-ESU-TU099C-011
Prep Type: Total/NA
Prep Batch: 492625

| Analyte | Sample | Sample | DU | | Total | | LOQ | DLC | Unit | RER | Limit |
|------------------|---------|--------|----------|------|--------------------|---|--------|--------|-------|------|-------|
| | Result | Qual | Result | Qual | Uncert. (2σ+/-) | | | | | | |
| Bismuth-212 | 0.219 | U | -0.3097 | U | 0.763 | | 0.600 | pCi/g | | 0.47 | 1 |
| Bismuth-214 | 0.305 | | 0.3560 | | 0.122 | | 0.0451 | pCi/g | | 0.23 | 1 |
| Cesium-137 | 0.00354 | U | -0.00445 | U | 0.0762 | 7 | 0.0700 | 0.0625 | pCi/g | 0.07 | 1 |
| Lead-210 | 0.476 | U | -0.7765 | U | 1.69 | | | 1.42 | pCi/g | 0.46 | 1 |
| Lead-212 | 0.295 | | 0.4009 | | 0.0954 | | 0.0400 | pCi/g | | 0.64 | 1 |
| Lead-214 | 0.340 | | 0.3982 | | 0.107 | | 0.0518 | pCi/g | | 0.32 | 1 |
| Potassium-40 | 7.62 | | 7.920 | | 1.47 | | 0.112 | pCi/g | | 0.11 | 1 |
| Protactinium-231 | 0.250 | U | 0.0000 | U | 0.538 | | 1.99 | pCi/g | | 0.17 | 1 |
| Protactinium-234 | 0.0647 | U | -0.09732 | U | 0.295 | | 0.240 | pCi/g | | 0.39 | 1 |
| Radium-226 | 0.305 | | 0.3560 | | 0.122 | | 0.200 | 0.0451 | pCi/g | 0.23 | 1 |
| Radium-228 | 0.382 | | 0.3726 | | 0.146 | | 0.0288 | pCi/g | | 0.03 | 1 |
| Thallium-208 | 0.133 | | 0.1595 | | 0.0539 | | 0.0137 | pCi/g | | 0.30 | 1 |
| Thorium 228 | 0.295 | | 0.4009 | | 0.0954 | | 0.0400 | pCi/g | | 0.64 | 1 |
| Thorium-232 | 0.382 | | 0.3726 | | 0.146 | | 0.0288 | pCi/g | | 0.03 | 1 |
| Thorium-234 | -0.289 | U | 1.225 | | 0.555 | | 0.273 | pCi/g | | 1.07 | 1 |
| Uranium-235 | 0.123 | U | -0.02121 | U | 0.0394 | | 0.403 | pCi/g | | 0.37 | 1 |
| Uranium-238 | -0.289 | U | 1.225 | | 0.555 | | 0.273 | pCi/g | | 1.07 | 1 |

Eurofins TestAmerica, St. Louis

QC Association Summary

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Rad

Leach Batch: 492277

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|-----------------|---------------------|-----------|--------|---------------|------------|
| 160-40797-1 | HPPG-ESU-TU099C-001 | Total/NA | Solid | Dry and Grind | |
| 160-40797-2 | HPPG-ESU-TU099C-002 | Total/NA | Solid | Dry and Grind | |
| 160-40797-3 | HPPG-ESU-TU099C-003 | Total/NA | Solid | Dry and Grind | |
| 160-40797-4 | HPPG-ESU-TU099C-004 | Total/NA | Solid | Dry and Grind | |
| 160-40797-5 | HPPG-ESU-TU099C-005 | Total/NA | Solid | Dry and Grind | |
| 160-40797-6 | HPPG-ESU-TU099C-006 | Total/NA | Solid | Dry and Grind | |
| 160-40797-7 | HPPG-ESU-TU099C-007 | Total/NA | Solid | Dry and Grind | |
| 160-40797-8 | HPPG-ESU-TU099C-008 | Total/NA | Solid | Dry and Grind | |
| 160-40797-9 | HPPG-ESU-TU099C-009 | Total/NA | Solid | Dry and Grind | |
| 160-40797-10 | HPPG-ESU-TU099C-010 | Total/NA | Solid | Dry and Grind | |
| 160-40797-11 | HPPG-ESU-TU099C-011 | Total/NA | Solid | Dry and Grind | |
| 160-40797-12 | HPPG-ESU-TU099C-012 | Total/NA | Solid | Dry and Grind | |
| 160-40797-13 | HPPG-ESU-TU099C-013 | Total/NA | Solid | Dry and Grind | |
| 160-40797-14 | HPPG-ESU-TU099C-014 | Total/NA | Solid | Dry and Grind | |
| 160-40797-15 | HPPG-ESU-TU099C-015 | Total/NA | Solid | Dry and Grind | |
| 160-40797-16 | HPPG-ESU-TU099C-016 | Total/NA | Solid | Dry and Grind | |
| 160-40797-17 | HPPG-ESU-TU099C-017 | Total/NA | Solid | Dry and Grind | |
| 160-40797-18 | HPPG-ESU-TU099C-018 | Total/NA | Solid | Dry and Grind | |
| 160-40797-19 | HPPG-ESU-TU099C-019 | Total/NA | Solid | Dry and Grind | |
| 160-40797-20 | HPPG-ESU-TU099C-020 | Total/NA | Solid | Dry and Grind | |
| 160-40797-21 | HPPG-ESU-TU099C-021 | Total/NA | Solid | Dry and Grind | |
| 160-40797-11 DU | HPPG-ESU-TU099C-011 | Total/NA | Solid | Dry and Grind | |

Leach Batch: 492295

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------|---------------------|-----------|--------|---------------|------------|
| 160-40797-22 | HPPG-ESU-TU099C-022 | Total/NA | Solid | Dry and Grind | |
| 160-40797-23 | HPPG-ESU-TU099C-023 | Total/NA | Solid | Dry and Grind | |
| 160-40797-24 | HPPG-ESU-TU099C-024 | Total/NA | Solid | Dry and Grind | |
| 160-40797-25 | HPPG-ESU-TU099C-025 | Total/NA | Solid | Dry and Grind | |
| 160-40797-26 | HPPG-F-059 | Total/NA | Solid | Dry and Grind | |
| 160-40797-27 | HPPG-F-060 | Total/NA | Solid | Dry and Grind | |

Prep Batch: 492605

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|-------------------|---------------------|-----------|--------|-------------|------------|
| 160-40797-12 | HPPG-ESU-TU099C-012 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-13 | HPPG-ESU-TU099C-013 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-14 | HPPG-ESU-TU099C-014 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-15 | HPPG-ESU-TU099C-015 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-16 | HPPG-ESU-TU099C-016 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-17 | HPPG-ESU-TU099C-017 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-18 | HPPG-ESU-TU099C-018 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-19 | HPPG-ESU-TU099C-019 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-20 | HPPG-ESU-TU099C-020 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-21 | HPPG-ESU-TU099C-021 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-22 | HPPG-ESU-TU099C-022 | Total/NA | Solid | Fill_Geo-21 | 492295 |
| 160-40797-23 | HPPG-ESU-TU099C-023 | Total/NA | Solid | Fill_Geo-21 | 492295 |
| 160-40797-24 | HPPG-ESU-TU099C-024 | Total/NA | Solid | Fill_Geo-21 | 492295 |
| 160-40797-25 | HPPG-ESU-TU099C-025 | Total/NA | Solid | Fill_Geo-21 | 492295 |
| 160-40797-26 | HPPG-F-059 | Total/NA | Solid | Fill_Geo-21 | 492295 |
| 160-40797-27 | HPPG-F-060 | Total/NA | Solid | Fill_Geo-21 | 492295 |
| MB 160-492605/1-A | Method Blank | Total/NA | Solid | Fill_Geo-21 | |

Eurofins TestAmerica, St. Louis

QC Association Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40797-1
SDG: GJ46599742

Rad (Continued)

Prep Batch: 492605 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|--------------------|-----------|--------|-------------|------------|
| LCS 160-492605/2-A | Lab Control Sample | Total/NA | Solid | Fill_Geo-21 | |

Prep Batch: 492625

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|---------------------|-----------|--------|-------------|------------|
| 160-40797-1 | HPPG-ESU-TU099C-001 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-2 | HPPG-ESU-TU099C-002 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-3 | HPPG-ESU-TU099C-003 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-4 | HPPG-ESU-TU099C-004 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-5 | HPPG-ESU-TU099C-005 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-6 | HPPG-ESU-TU099C-006 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-7 | HPPG-ESU-TU099C-007 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-8 | HPPG-ESU-TU099C-008 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-9 | HPPG-ESU-TU099C-009 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-10 | HPPG-ESU-TU099C-010 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| 160-40797-11 | HPPG-ESU-TU099C-011 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| MB 160-492625/1-A | Method Blank | Total/NA | Solid | Fill_Geo-21 | |
| LCS 160-492625/2-A | Lab Control Sample | Total/NA | Solid | Fill_Geo-21 | |
| 160-40797-11 DU | HPPG-ESU-TU099C-011 | Total/NA | Solid | Fill_Geo-21 | 492277 |

Prep Batch: 493207

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|---------------------|-----------|--------|--------|------------|
| 160-40797-1 | HPPG-ESU-TU099C-001 | Total/NA | Solid | DPS-7 | 492277 |
| 160-40797-11 | HPPG-ESU-TU099C-011 | Total/NA | Solid | DPS-7 | 492277 |
| 160-40797-21 | HPPG-ESU-TU099C-021 | Total/NA | Solid | DPS-7 | 492277 |
| MB 160-493207/23-A | Method Blank | Total/NA | Solid | DPS-7 | |
| LCS 160-493207/1-A | Lab Control Sample | Total/NA | Solid | DPS-7 | |

Tracer/Carrier Summary

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40797-1
SDG: GJ46599742

Method: 905 - Strontium-90 (GFPC)

Matrix: Solid

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

| Lab Sample ID | Client Sample ID | Sr (40-110) | Y (40-110) |
|--------------------|---------------------|----------------|---------------|
| 160-40797-1 | HPPG-ESU-TU099C-001 | 94.2 | 89.7 |
| 160-40797-11 | HPPG-ESU-TU099C-011 | 97.5 | 93.8 |
| 160-40797-21 | HPPG-ESU-TU099C-021 | 97.1 | 90.8 |
| LCS 160-493207/1-A | Lab Control Sample | 103 | 81.5 |
| MB 160-493207/23-A | Method Blank | 101 | 90.1 |

Tracer/Carrier Legend

Sr = Sr Carrier

Y = Y Carrier



Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-40796-1
Laboratory Sample Delivery Group: D1189449
Client Project/Site: HPNS-Parcel G 501197
Revision: 1

For:
Aptim Federal Services LLC
4005 Port Chicago Hwy, Suite 200
Concord, California 94520

Attn: Rose Condit

Elizabeth M. Hoercher

Authorized for release by:
4/13/2021 3:38:03 PM
Elizabeth Hoercher, Project Manager I
Elizabeth.Hoercher@Eurofinset.com

Designee for
Rhonda Ridenhower, Client Service Manager
(314)298-8566
Rhonda.Ridenhower@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40796-1
SDG: D1189449

Job ID: 160-40796-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

CASE NARRATIVE

Client: Aptim Federal Services LLC

Project: HPNS-Parcel G 501197

Report Number: 160-40796-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, St. Louis attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an ""as received"" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

The matrix for the Method Blank and LCS is as close to the following samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

Revision 1- Additional information requested in case narrative for total strontium.

Case Narrative

Page 60 of 71

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40796-1
SDG: D1189449

Job ID: 160-40796-1 (Continued)

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

RECEIPT

The samples were received on 12/15/2020; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 5.3 C.

STRONTIUM-90 (GFPC)

Sample HPPG-ESU-TUO99C-B-001 (160-40796-1) was analyzed for Strontium-90 (GFPC) in accordance with EPA 905. The samples were dried on 12/17/2020, prepared on 12/28/2020 and analyzed on 01/06/2021.

When taking small mass aliquots from dried/disaggregated sample, the laboratory avoids large rocks/pebbles (as well as sticks, etc) which may constitute a larger than representative portion of the aliquot. Smaller rocks may be included. This is consistent with QSM and Laboratory SOP. HPPG-ESU-TUO99C-B-001 (160-40796-1)

The method blank (MB) Z-score is within limits and is located in the level IV raw data. (MB 160-493207/23-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Sample HPPG-ESU-TUO99C-B-001 (160-40796-1) was analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were dried on 12/17/2020, prepared on 12/21/2020 and analyzed on 01/11/2021.

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from Reported to Analyte

| | |
|---------|---------|
| Th-234 | Pa-234 |
| Th-234 | U-238 |
| Pb-210 | Po-210 |
| Pb-210 | Bi-210 |
| Cs-137 | Ba-137m |
| Pb-212 | Po-216 |
| Xe-131m | Xe-131 |
| Sb-125 | Te-125m |
| Ag-108m | Ag-108 |
| Rh-106 | Ru-106 |
| Pb-212 | Th-228 |
| Pb-212 | Ra-224 |
| U-235 | Th-231 |
| Ac-228 | Th-232 |
| Ac-228 | Ra-228 |
| Th-227 | Ra-223 |
| Th-227 | Ac-227 |
| Th-227 | Bi-211 |
| Th-227 | Pb-211 |
| Bi-214 | Ra-226 |

The method blank (MB) Z-score is within limits and is located in the level IV raw data. (MB 160-492625/1-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



CHAIN OF CUSTODY

Ref. Document # 501197RSY-057

Page 1 of 2

APTIM Federal Services, LLC

4005 Port Chicago Hwy
Concord, CA 94520Project Manager: Lisa Bercik
Phone #: (619)213-3389Send Report to: Rose Condit
Phone/Fax Number: 415-987-0760
Address: 4005 Port Chicago Hwy

Sample Lead: Murri, Andrew

Sample Tech(s): Paul Leblanc
Katrina Owens
Joaquin Rodrigues

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| | | | | | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------|--------|------------------------------------------------------------------------------------------------------------|----------------------|--------------------|---|---|--|---|----------|
| Project Number: 501197 Project Name: Hunters Point Naval Shipyard: Parcel G Remedial Action Project Location: San Francisco, CA Purchase Order #: 1159058 Shipment/Pickup Date: 12/14/2020 Waybill Number: 4957 0825 9163 Lab Destination: Test America (St. Louis Lab) 13715 Rider Trail North Earth City, MO 63046 | | | | Analysis Requested Gamma Spec (EPA 9011 M) - EPA 21 Struvite-90 (EPA 905 MDD) Day in growth gauge | | | | | | | |
| Lab Contact Name/ph # Rhoeda Ridenbower (314)298-8566 | | | | Dose Rate uR/Hr | Evidence Bag ID | Comment | | | | | |
| | Collection Information | | | Preservatives (water) | | | | | | | |
| Sample ID | Date | Time | Method | Matrix | Preservatives (soil) | | | | | | |
| HPPG-ESU-TU099C-B-001 | 12/12/2020 | 10:01 | G | SO | 1 | 16 oz. plastic jar | X | X | | 4 | D1189449 |

Special Instructions: 21 day ingrowth results only

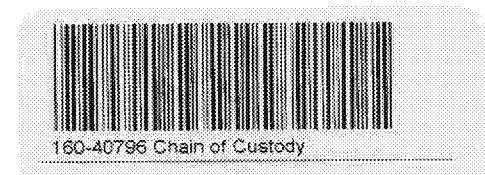
Turanaround Time: 3-day 10-Day 28-day Other

Level of QC Required: I II III Project Specific

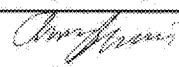
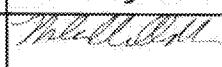
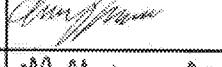
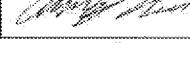
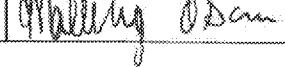
Method Codes C = Composite G = Grab Matrix Codes: DW = Drinking Water; So = Soil; GW = Ground Water; SL = Sludge; WW = Waste Water; CP = Chip Samples; A = Air; ABS = Asbestos; PO = Pipe Opening

| Relinquished By: | Relinquisher Signature: | Relinquish Date Time: | Received By: | Received Signature: | Receive Date Time: |
|----------------------------|-------------------------|-----------------------|----------------------------|---------------------|--------------------|
| Murri, Andrew | | 12/12/2020 14:58 | Locked Storage (RKillpack) | | 12/12/2020 14:58 |
| Locked Storage (RKillpack) | | 12/14/2020 10:13 | Andrew Murri | | 12/14/2020 10:13 |
| Andrew Murri | | 12/14/2020 10:22 | SHIPPEDTOLAB | | 12/15/2020 09:24 |

*** Last 3 transfers shown above - Complete list of transfers on last page ***



All Transfers for COC 501197RSY-057

| Relinquished By: | Relinquisher Signature: | Relinquish Date Time: | Received By: | Received Signature: | Receive Date Time: |
|----------------------------|-----------------------------------------------------------------------------------|-----------------------|----------------------------|-------------------------------------------------------------------------------------|--------------------|
| Murri, Andrew |  | 12/12/2020 14:58 | Locked Storage (RKillpack) |  | 12/12/2020 14:58 |
| Locked Storage (RKillpack) |  | 12/14/2020 10:13 | Andrew Murri |  | 12/14/2020 10:13 |
| Andrew Murri |  | 12/14/2020 10:22 | SHIPPEDTOLAB |  | 12/15/20 09:24 |

Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-40796-1
SDG Number: D1189449**Login Number: 40796****List Source: Eurofins TestAmerica, St. Louis****List Number: 1****Creator: O'Gara, Mallory L**

| Question | Answer | Comment |
|----------------------------------------------------------------------------------|--------|---------|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time (excluding tests with immediate HTs) | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

Definitions/Glossary

Page 64 of 71

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40796-1
SDG: D1189449

Qualifiers

| Rad Qualifier | Qualifier Description |
|---------------|---------------------------------------|
| U | Undetected at the Limit of Detection. |

Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|----------------|-------------------------------------------------------------------------------------------------------------|
| % | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| CNF | Contains No Free Liquid |
| DER | Duplicate Error Ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL | Detection Limit (DoD/DOE) |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision Level Concentration (Radiochemistry) |
| EDL | Estimated Detection Limit (Dioxin) |
| LOD | Limit of Detection (DoD/DOE) |
| LOQ | Limit of Quantitation (DoD/DOE) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| QC | Quality Control |
| RER | Relative Error Ratio (Radiochemistry) |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |
| TNTC | Too Numerous To Count |

Method Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40796-1
SDG: D1189449

| Method | Method Description | Protocol | Laboratory |
|---------------|-----------------------------------------------------------------|----------|------------|
| 905 | Strontium-90 (GFPC) | EPA | TAL SL |
| GA-01-R | Radium-226 & Other Gamma Emitters (GS) | DOE | TAL SL |
| DPS-7 | Preparation, Digestion/Precipitate Separation (7-Day In-Growth) | None | TAL SL |
| Dry and Grind | Preparation, Dry and Grind | None | TAL SL |
| Fill_Geo-21 | Fill Geometry, 21-Day In-Growth | None | TAL SL |

Protocol References:

DOE = U.S. Department of Energy

EPA = US Environmental Protection Agency

None = None

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40796-1
SDG: D1189449

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---------------|-----------------------|--------|----------------|----------------|----------|
| 160-40796-1 | HPPG-ESU-TUO99C-B-001 | Solid | 12/12/20 10:01 | 12/15/20 09:24 | |

Eurofins TestAmerica, St. Louis

Client Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40796-1
SDG: D1189449

Client Sample ID: HPPG-ESU-TUO99C-B-001

Lab Sample ID: 160-40796-1

Matrix: Solid

Date Collected: 12/12/20 10:01
Date Received: 12/15/20 09:24

Method: 905 - Strontium-90 (GFPC)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|----------------|---------------|------------------|--------------------|--------------------|-------|-------|-------|-----------------|-----------------|----------------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Strontium-90 | -0.0713 | U | 0.157 | 0.158 | 0.331 | 0.135 | pCi/g | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| Carrier | %Yield | Qualifier | Limits | | | | | Prepared | Analyzed | Dil Fac |
| Sr Carrier | 95.5 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |
| Y Carrier | 92.0 | | 40 - 110 | | | | | 12/28/20 18:50 | 01/06/21 17:30 | 1 |

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

| Analyte | Result | Qualifier | Count | Total | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|--------------------|--------------|-----------|--------------------|--------------------|--------|--------|-------|----------------|----------------|---------|
| | | | Uncert. (2σ+/-) | Uncert. (2σ+/-) | | | | | | |
| Actinium 228 | 0.306 | | 0.216 | 0.219 | | 0.0911 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Actinium-227 | 0.0408 | U | 0.119 | 0.119 | | 0.403 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Bismuth-212 | -0.0522 | U | 0.774 | 0.774 | | 0.631 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Bismuth-214 | 0.390 | | 0.139 | 0.146 | | 0.0599 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Cesium-137 | 0.00936 | U | 0.0841 | 0.0841 | 0.0700 | 0.0685 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Lead-210 | 1.33 | | 1.69 | 1.70 | | 1.09 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Lead-212 | 0.277 | | 0.0954 | 0.101 | | 0.0565 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Lead-214 | 0.343 | | 0.114 | 0.121 | | 0.0538 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Potassium-40 | 7.76 | | 1.47 | 1.72 | | 0.360 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Protactinium-231 | 0.763 | U | 2.14 | 2.14 | | 2.28 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Protactinium-234 | -0.0244 | U | 0.136 | 0.136 | | 0.278 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Radium-226 | 0.390 | | 0.139 | 0.146 | 0.200 | 0.0599 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Radium-228 | 0.306 | | 0.216 | 0.219 | | 0.0911 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Thallium-208 | 0.113 | | 0.0482 | 0.0499 | | 0.0146 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Thorium 228 | 0.277 | | 0.0954 | 0.101 | | 0.0565 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Thorium-232 | 0.306 | | 0.216 | 0.219 | | 0.0911 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Thorium-234 | 0.620 | | 0.651 | 0.656 | | 0.428 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Uranium-235 | 0.260 | U | 0.374 | 0.375 | | 0.447 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |
| Uranium-238 | 0.620 | | 0.651 | 0.656 | | 0.428 | pCi/g | 12/21/20 11:11 | 01/11/21 07:12 | 1 |

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QC Sample Results

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40796-1
SDG: D1189449

Method: 905 - Strontium-90 (GFPC)

Lab Sample ID: MB 160-493207/23-A

Matrix: Solid

Analysis Batch: 494113

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 493207

| Analyte | MB | MB | Count Uncert. (2σ+/-) | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|-------------------|---------|-----------|-----------------------------|-----------------------------|-------|-------|-------|----------------|----------------|---------|
| | Result | Qualifier | | | | | | | | |
| Strontium-90 | 0.04436 | U | 0.145 | 0.145 | 0.331 | 0.116 | pCi/g | 12/28/20 18:50 | 01/06/21 17:55 | 1 |
| Carrier | | | | | | | | | | |
| <i>Sr Carrier</i> | | | | | | | | | | |
| 101 | | | | | | | | | | |
| <i>Y Carrier</i> | | | | | | | | | | |
| 90.1 | | | | | | | | | | |
| 40 - 110 | | | | | | | | | | |
| 40 - 110 | | | | | | | | | | |

Lab Sample ID: LCS 160-493207/1-A

Matrix: Solid

Analysis Batch: 494112

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 493207

| Analyte | MB | MB | Spike Added | LCS Result | LCS Qual | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | %Rec | %Rec. Limits |
|-------------------|--------|-----------|----------------|---------------|-------------|-----------------------------|-------|-------|-------|------|-----------------|
| | Result | Qualifier | | | | | | | | | |
| Strontium-90 | 7.75 | | | 6.324 | | 0.698 | 0.331 | 0.131 | pCi/g | 82 | 75 - 125 |
| Carrier | | | | | | | | | | | |
| <i>Sr Carrier</i> | | | | | | | | | | | |
| 103 | | | | | | | | | | | |
| <i>Y Carrier</i> | | | | | | | | | | | |
| 81.5 | | | | | | | | | | | |
| 40 - 110 | | | | | | | | | | | |
| 40 - 110 | | | | | | | | | | | |

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-492625/1-A

Matrix: Solid

Analysis Batch: 494547

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 492625

| Analyte | MB | MB | Count Uncert. (2σ+/-) | Total Uncert. (2σ+/-) | LOQ | DLC | Unit | Prepared | Analyzed | Dil Fac |
|------------------|----------|-----------|-----------------------------|-----------------------------|--------|--------|-------|----------------|----------------|---------|
| | Result | Qualifier | | | | | | | | |
| Actinium 228 | 0.04214 | U | 0.164 | 0.164 | | 0.115 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Actinium-227 | -0.3299 | U | 0.694 | 0.695 | | 0.395 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Bismuth-212 | -0.02134 | U | 0.859 | 0.859 | | 0.705 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Bismuth-214 | 0.04187 | U | 0.0575 | 0.0576 | | 0.151 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Cesium-137 | 0.003494 | U | 0.0428 | 0.0428 | 0.0700 | 0.0345 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Lead-210 | -0.7074 | U | 1.37 | 1.37 | | 1.17 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Lead-212 | -0.01201 | U | 0.0608 | 0.0608 | | 0.0505 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Lead-214 | -0.09938 | U | 0.133 | 0.133 | | 0.111 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Potassium-40 | -0.3130 | U | 1.10 | 1.10 | | 0.572 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Protactinium-231 | 0.4064 | U | 1.30 | 1.30 | | 1.44 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Protactinium-234 | 0.08226 | U | 0.221 | 0.221 | | 0.177 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Radium-226 | 0.04187 | U | 0.0575 | 0.0576 | 0.200 | 0.151 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Radium-228 | 0.04214 | U | 0.164 | 0.164 | | 0.115 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thallium-208 | 0.03952 | U | 0.0299 | 0.0302 | | 0.0416 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thorium 228 | -0.01201 | U | 0.0608 | 0.0608 | | 0.0505 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thorium-232 | 0.04214 | U | 0.164 | 0.164 | | 0.115 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Thorium-234 | -0.5682 | U | 0.672 | 0.675 | | 1.07 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Uranium-235 | 0.0000 | U | 0.0633 | 0.0633 | | 0.330 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |
| Uranium-238 | -0.5682 | U | 0.672 | 0.675 | | 1.07 | pCi/g | 12/21/20 11:11 | 01/11/21 06:33 | 1 |

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QC Sample Results

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40796-1
SDG: D1189449

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-492625/2-A

Client Sample ID: Lab Control Sample

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 494546

Prep Batch: 492625

| Analyte | Spike Added | LCS | | Total | | DLC | Unit | %Rec | %Rec. Limits |
|---------------|----------------|--------|------|--------------------|--------|--------|-------|------|-----------------|
| | | Result | Qual | Uncert. (2σ+/-) | LOQ | | | | |
| Americium-241 | 96.4 | 98.26 | | 11.6 | | 0.586 | pCi/g | 102 | 87 - 116 |
| Cesium-137 | 26.7 | 29.70 | | 3.12 | 0.0700 | 0.129 | pCi/g | 111 | 87 - 120 |
| Cobalt-60 | 9.37 | 9.998 | | 1.05 | | 0.0323 | pCi/g | 107 | 87 - 115 |

Eurofins TestAmerica, St. Louis

QC Association Summary

Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

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Job ID: 160-40796-1
SDG: D1189449

Rad

Leach Batch: 492277

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------|-----------------------|-----------|--------|---------------|------------|
| 160-40796-1 | HPPG-ESU-TUO99C-B-001 | Total/NA | Solid | Dry and Grind | |

Prep Batch: 492625

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|-----------------------|-----------|--------|-------------|------------|
| 160-40796-1 | HPPG-ESU-TUO99C-B-001 | Total/NA | Solid | Fill_Geo-21 | 492277 |
| MB 160-492625/1-A | Method Blank | Total/NA | Solid | Fill_Geo-21 | |
| LCS 160-492625/2-A | Lab Control Sample | Total/NA | Solid | Fill_Geo-21 | |

Prep Batch: 493207

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|-----------------------|-----------|--------|--------|------------|
| 160-40796-1 | HPPG-ESU-TUO99C-B-001 | Total/NA | Solid | DPS-7 | 492277 |
| MB 160-493207/23-A | Method Blank | Total/NA | Solid | DPS-7 | |
| LCS 160-493207/1-A | Lab Control Sample | Total/NA | Solid | DPS-7 | |

Eurofins TestAmerica, St. Louis

Tracer/Carrier Summary

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Client: Aptim Federal Services LLC
Project/Site: HPNS-Parcel G 501197

Job ID: 160-40796-1
SDG: D1189449

Method: 905 - Strontium-90 (GFPC)

Matrix: Solid

Prep Type: Total/NA

| Lab Sample ID | Client Sample ID | Percent Yield (Acceptance Limits) | |
|--------------------|-----------------------|-----------------------------------|---------------|
| | | Sr (40-110) | Y (40-110) |
| 160-40796-1 | HPPG-ESU-TUO99C-B-001 | 95.5 | 92.0 |
| LCS 160-493207/1-A | Lab Control Sample | 103 | 81.5 |
| MB 160-493207/23-A | Method Blank | 101 | 90.1 |

Tracer/Carrier Legend

Sr = Sr Carrier

Y = Y Carrier

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